



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Introduction



Version 3.1 (October 2021)

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1 Introduction

The Education Directorate's Infrastructure Specification (EDIS) is the briefing document for design consultants and construction contractors during the development of ACT Government public school infrastructure projects. The Request For Tender (RFT) documents provide the general project information, contractual and tendering requirements for a project with the Education Directorate's Infrastructure Specification usually provided as appendices to the RFT during Masterplanning and Design and Construction phases. The EDIS documents will form part of the Principal's Documents in GC21 contracts.

The structure of the Parts of the EDIS are described in Table 1 below. The detailed overview of the project as well as any site specific requirements and changes to any application of the generic specification, regardless of whether the project is on a brownfield or greenfield site, is provided in *Part A – Project Specific Requirements*. All other Parts of the EDIS are generic specifications.

1.1 Structure of the Education Directorate's Infrastructure Specification (Output Specification)

The Output Specification is structured as shown in *Table 1*.

Table 1: Output Specification structure

Part	Heading	Contents
A	Project Specific Requirements	Provides specific information about an individual project, including enrolment, school configuration, stakeholders, proposed community use, site location and description, site conditions, project infrastructure, site planning and requirements for sports fields, site development, car parking and other scope requirements specific to this project. It also includes any previously prepared reference design or Masterplanning option/s.
B	Functional Brief	Outlines the functional requirements, functional relationships and specific functional requirements for each type of schooling (sector) in the ACT: Preschool–Year 6, Preschool–Year 10, Year 7 – Year 10 High School, Year 11 – Year 12 Senior Secondary College or Specialist School.
C	Masterplanning and Architectural Specification	Details the Masterplanning requirements and architectural design principles. Provides details of the minimum requirements for landscape and traffic design.
D	Technical Specification	Details the minimum performance standards for each element of the building and fabric performance, ESD, engineering services, civil and structural requirements, utility, ICT and communication requirements that the Contractor must provide to all Facilities.
E	Furniture, Fittings and Equipment Specification	Details the FF&E requirements for the Project.

The structure described above indicates the order of importance of the individual parts of the brief e.g.

- Project specific requirements, Part A are prioritised over the generalised Part B or
- The functional requirements, Part B are prioritised over the Technical Specifications, Part D

1.2 Guiding Principles

All of the parts of the brief are governed by the following set of principles:

- **Education Principles** translate the Directorate's vision, values and priorities into general principles to guide the design of all aspects of education—pedagogy, curriculum, professional learning, school organisation, leadership, inclusion, wellbeing, cultural integrity and engagement with community
- **Education Facilities Design Principles** capture the implications of the education principles for the design of facilities — *Part B, Appendix 3.1*
- **Universal Design Principles**, from the Centre for Excellence in Universal Design, concern the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design
- **Cultural Integrity**, encompasses the culture and inclusion of the connection to the local Ngunnawal Country in the design
- **Sustainable Design Principles**, aim to create sustainable education environments, comprised of architecture, landscape, transport, linkages to broader networks and infrastructure that are low carbon, water sensitive and

resource efficient in both construction and operation.

- **Architectural, Urban Planning and Masterplanning Principles** —*EDIS, Part C*

1.2.1 Overarching Principles and Education Facilities Design Principles

Education Facilities Design Principles guide the design of school facilities to ensure they are aligned with the Directorate's vision and values. They include both **general overarching design principles** and more **specific education facilities design principles** derived from the Directorate's vision for learning.

The three key overarching design principles are:

- Responsive design
- Universal design
- Cultural Integrity

1.2.2 Overarching Principle – Responsive Design

Adhering to the specific Education Facilities Design Principles the design and subsequent construction of the facilities and the facilities management systems must also be **responsive** to the requirements of individual schools i.e.:

- enable individual schools to implement their own learning and teaching approach e.g. ensure the schools can adapt to a range of different organisational models that may be developed by the school leaders, staff and community over the life of the facility
- enable school-based decisions concerning specialisation
- embed the potential for adaptability for varied current uses

Therefore, **responsive design requires that facilities be able to be reconfigured, without major re-construction and expense, to accommodate changing needs resulting from new learning technologies, curriculum changes and changing demands for use that might occur over the long term. As such this brief requires the minimal use of "load-bearing walls" in the construction to allow for ease of removal if required in the future. All architectural drawings must clearly highlight where the use of load bearing walls are intended for the design phase.**

School design must be responsive to the needs of the learners, which may vary from school to school.

Consequently, the design and construction of learning facilities must be careful not to impose one way of working. Rather, the designs need to support whatever organisational model that a school develops to suit the needs of their learners.

1.2.3 Overarching Principle – Universal Design

The Directorate's commitment to the principles of 'equity, universality and non-discrimination' highlights the necessity to incorporate Universal Design principles into all aspects of the design of the Facilities. Universal Design is the design of products and environments (both indoor and outdoor) to be usable by all people, without the need for adaptation or specialised design. **Universal Design focuses on creating the environment that promotes inclusion through:**

- Equitable use: the design is useful to people with diverse abilities.
- Flexibility in use: the design accommodates a wide range of individual preferences and abilities.
- Simple and intuitive: use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- Perceptible information: the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
- Tolerance for error: the design minimizes hazards and the adverse consequences of accidental or unintended actions.
- Low physical effort: the design can be used efficiently and comfortably and with a minimum of fatigue.
- Size and space for approach and use: appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

1.2.4 Overarching Principle – Cultural Integrity

The Directorate's commitment to the principle of "Cultural Integrity" requires the design to consider and incorporate the tangible and intangible aspects of the body of indigenous cultural practices, resources and knowledge systems, including living landscapes, song lines, spiritual connection and traditional associations.

Culturally aware design understands the deep importance of indigenous cultural heritage as a 'living culture' and respects a building's placement on Ngunnawal Country. This principle should be reflected in all aspects of the design of the Facilities.

1.2.5 Overarching Principle – Sustainable Design

The Directorate's commitment to the principle of "Sustainable Design" requires the design to consider and incorporate the necessary elements to create sustainable education environments. These elements include architecture, landscape, transport, linkages to broader networks and infrastructure that are low carbon, water sensitive and resource efficient in both construction and operation.

The individual specifications are predominately incorporated in Part D – Technical Specifications, however the other parts of the EDIS document will include sustainable design specifications.

1.2.6 Education Facilities Design Principles

The Directorate's four key education principles – personalise learning, develop community and partnership, honour diversity and foster wellbeing – translate into a set of Education Facilities Design principles – *Part B, Appendix 3.1*. These design principles provide a constant reference point for guiding the design process.

2 ACT Education Directorate

2.1 The Directorate's Vision and Values

The "Future of Education Strategy (The Future of Education – an ACT Education Strategy for the next ten years (published 2018)" outlines the plan for education in the ACT for the next decade.

<https://www.education.act.gov.au/our-priorities/future-of-education/resources/The-Future-of-Education-An-ACT-Education-Strategy-for-the-Next-Ten-Years>

2.2 Priorities and goals

The Directorate has identified five goals in the Strategic Plan 2018–2021: A leading Learning Organisation

Schools where students love to learn

Investing in early childhood

Evidence based decisions

Learning culture

United leadership

https://www.education.act.gov.au/_data/assets/pdf_file/0008/1225295/Strategic-Plan-2018-21-Interactive-Booklet.pdf

2.3 The Canberra Public School System

Canberra public schools are community oriented with school-based development of curriculum that is aligned to the outcomes and achievement standards of the Australian Curriculum and school based assessment. Schools are governed by a representative School Board.

2.3.1 Public School Types

Currently the ACT education system has a range of school types, which include:

- Preschools
- Early Childhood Schools (P–2)
- Preschool to year 6 (P–6)
- Preschool to year 10 (P–10)
- High Schools year 7 to year 10 (7–10)
- Secondary Schools year 7 to year 12 (7–12)
- Senior Secondary Colleges year 11 to year 12 (11–12)
- Specialist Schools and Education Centres provide a range of programs including outdoor education, instrumental music, a hospital school and specialised support for students with additional needs

2.3.2 Students with Additional Needs

ACT Public Schools provide safe and inclusive environments for all students, including those with additional needs. This provision is guided through the Future of Education Strategy and obligations as set out in policy and legislation and recommendations from reports as outlined below. The Strategy is based on four foundations and four principles for implementation that form a 'roadmap' for the future.

One of the four foundations is Inclusion in which diversity is embraced, all students are accommodated and a universal sense of belonging is fostered. In a thriving and inclusive education community, all students and their families feel welcomed and valued for who they are and what they can contribute. A strong sense of belonging is understood as a prerequisite to achievement.

Policy and Legislation

The below are policies and legislation which identify a school's obligation to ensure the provision of safe and inclusive environments.

[Disability Discrimination Act](#)

[Disability Standards for Education](#)

[ACT Public Schools Safe and Supportive Schools Policy](#)

[Senior Practitioner Act \(use of restrictive practice\)](#)

[Nationally Consistent Collection of Data on School Students with Disability](#)

[Students with a Disability: Meeting their Educational Needs 2018](#)

[Human Rights Act 2004](#)

[Education Act 2004](#)

[Discrimination Act 1991](#)

2.4 ACT Curriculum Requirements

The Directorate has implemented the Australian Curriculum as developed by the Australian Curriculum Assessment and Reporting Authority (ACARA).

The requirements for each of the ACT Sectors of Schooling i.e. Primary, High School, College and Specialist are described in each of the Sector specific *Part B – Functional Brief*.

The functional specifications for all sectors of school facilities are based on requirements of the Australian Curriculum and contemporary learning and teaching.

2.4.1 The ACT Education Directorate's Position on Pedagogy

The Future of Education

Impacted by accelerating globalization and rapid advances in technology, the world is facing unprecedented social, economic and environmental challenges. These developments bring about a myriad of new opportunities for human advancement, and therefore education.

The Directorate's *Future of Education Strategy* sets out how the ACT Government is striving towards providing an education system that supports all children to overcome and achieve in our ever-evolving world. The Government's vision for future learning aligns with the *OECD Future of Education and Skills: Education 2030* project which identifies that successful adults will need to be lifelong learners. The implementation of the Future of Education Strategy positions 21st century capabilities such as curiosity, imagination, resilience and self-regulation as an increasing focus within the current curriculum. Under the strategy, ACT schools will be strong Learning Communities that are focused on enabling learning by promoting equity, student agency, access and inclusion.

The Directorate's strategy takes into account the increasing services schools are being asked to provide for young people and the ways in which learning environments must be places that bring people together as a community and enable relationships to form between people and services. Education aims to achieve outcomes for young people that are equitable, irrespective of gender, economic, social, cultural or other causes. It can most effectively achieve this when it brings services and people together. Practitioners, policy makers and system leaders must therefore routinely operate in collaboration. Quality learning environments facilitate this collaboration.

Respecting the human agency of a child requires that students are active participants in their learning, making informed choices about what and how they learn, contributing to decisions about how their learning environment operates. Young people want a greater say in what and how they learn. They see themselves as decision makers within their learning environments. The capacity to set goals and take personal responsibility will be important for their future success.

In the ACT, school diversity is embraced, all students are accommodated and a universal sense of belonging fostered. Students seek a sense of belonging as a prerequisite to achieve in their learning. Inclusion means embracing diversity in all its forms, as well as specifically ensuring students with disability and their families are included in a way which suits them. The learning environments and approaches to teaching must make this inclusion and sense of belonging seamless.

2.5 The ACT Education Directorate's Position on Best Practice for Learning Space Design

Best practice for the ACT context is informed by the 2014 research by K. Dovey and K. Fisher. Dovey and Fisher (2014) conducted an international review of more than fifty award winning school designs summarising their findings into five learning space design genres they labelled 'typologies' (Figure 1). This research was later adapted by Imms, Cleveland and Fisher in 2016.

Dovey and Fisher's Learning Space Typologies

Dovey and Fisher (2014) identified five spatial typologies that identify learning environments that are of fundamentally different spatial configurations (Table 1). These typologies are differentiated by their relative degree of openness, from traditional classrooms (Type A – enclosed) to permanently open-plan spaces (Type E – open).

Table 1: Learning environment (school facility) spatial typologies identified by Dovey and Fisher (2014).

Spatial type	Description of the physical learning environment
A (enclosed)	A cluster of traditional classrooms connected by a corridor.
B	Similar to Type A, except that the corridor connecting the traditional classrooms is widened to create a breakout space, identified as 'street-space' or 'learning commons'
C	Walls between adjoining classrooms (but not the breakout space) are made flexible, enabling these classrooms to be opened-up, creating a new space identified as 'commons'
D	Walls between adjoining classrooms and the breakout space are flexible, allowing for the entire learning environment to become one larger space, whilst also retaining the ability to close it down into traditional classrooms
E (open)	The learning environment is open plan and cannot be converted into traditional classrooms without major renovation.

These typologies are represented visually below. It should be noted that these are **representations only**.



Figure 1: Dovey and Fisher's (2014) learning spaces types, as adapted in Imms, Cleveland, and Fisher (2016).

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ACT Best Practice

Research into the effectiveness of these typologies primarily focusses on the areas listed below. The findings of this research and testing within actual school environments both locally in the ACT and interstate inform the best practice described for this Brief.

- 1) **Safety in the learning environment**, as experienced and perceived by users. While all the spatial types are considered to be safe for students and teachers, a high degree of visibility throughout the space has been linked to a decrease in student Bullying behaviour, this is enhanced by types C, D and E. The ability to close down spaces for safety reasons was also evaluated and again considered more beneficial. As a result types C and D are considered more effective. The ACT context mandates procedures for schools to be able to internally lockdown as part of their emergency procedures, as a result type D is preferred.
- 2) **The range of pedagogical encounters supported by the learning environment**. All learning environments evaluated were considered to be supportive of a range of pedagogical encounters. However, some learning environment typologies were found to be more supportive of certain encounters than others. For example, small group work was identified as challenging in type A and B learning environments, while whole class work was identified as challenging in type E learning environments.
- 3) **The ability for teachers to supervise students in the learning environment**. Generally, the learning environments were found to afford teachers a high level of supervision over students. Type A and B learning environments were found to be less supportive of teacher supervision than type C, D and E learning environments. Teachers and School Leaders report that the ability to provide structured supervision in Type E was more challenging.
- 4) **The range of professional learning opportunities which are offered to staff**. While the majority of teachers feel supported to employ the pedagogies desired by their school, teachers working in types C and in particular D report that the opportunities to collaborate and learn from their colleagues were greater.
- 5) **The learning environments provide teachers and students with adequate space**. While students and teachers are generally comfortable with the amount of space provided for teachers and students to complete their work, the ability to be flexible with that space is paramount. The typology that is considered to provide the most efficient and effective flexible use of the space is type D.

An additional factor: **the ability to change the internal configuration in the future, without major renovation** was also used in the determination of best practice. Type D is considered best practice for this criterion.

As a result, **best practice for learning Space design in the ACT is highlighted by Type D of the Dovey and Fisher Model**. Please note that Bi-folding walls or doors are not considered best practice and the use of glass sliding doors is the best practice for the ACT context.



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Part A: Project Specific Requirements

New Schools



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Strathnairn ECEC – Year 6 School

Part A: PROJECT SPECIFIC REQUIREMENTS (New School)

This schedule shall be read in conjunction with the requirements detailed in the REOI including, without limitation, the Education Directorates Infrastructure Specification (EDIS).

Overview																																																						
Name of Project	Strathnairn ECEC – Year 6 School																																																					
School Configuration	Sector of School: Early Childhood Education and Care (ECEC) and Primary (P – 6)																																																					
Student Enrolment	These projections are supplied by the Education Directorate’s Enrolment and Planning Section: - Opening Enrolment for P – 6 School – 122 - Long Term Capacity (LTE) for P – 6 School – 780 - Peak Capacity for P – 6 School – 980 - Long Term Capacity (LTE) for ECEC – 130 <table><tr><td></td><td>2024</td><td>2025</td><td>2026</td><td>2027</td><td>2028</td><td>2029</td><td>2030</td><td>2031</td></tr><tr><td>Opening Enrolment</td><td>122</td><td>203</td><td>277</td><td>362</td><td>431</td><td>509</td><td>591</td><td>648</td></tr><tr><td>LTE Capacity</td><td>780</td><td>780</td><td>780</td><td>780</td><td>780</td><td>780</td><td>780</td><td>780</td></tr><tr><td>Peak Capacity</td><td>980</td><td>980</td><td>980</td><td>980</td><td>980</td><td>980</td><td>980</td><td>980</td></tr><tr><td>ECEC</td><td>130</td><td>130</td><td>130</td><td>130</td><td>130</td><td>130</td><td>130</td><td>130</td></tr></table> Note: These projections are indicative and may change. Peak capacity figure includes the provision for future expansion as referenced in the document below. Opening enrolment numbers, LTE and Peak Capacity figures do not include the ECEC. The ECEC LTE figures are in addition to the P – 6 figures.										2024	2025	2026	2027	2028	2029	2030	2031	Opening Enrolment	122	203	277	362	431	509	591	648	LTE Capacity	780	780	780	780	780	780	780	780	Peak Capacity	980	980	980	980	980	980	980	980	ECEC	130	130	130	130	130	130	130	130
	2024	2025	2026	2027	2028	2029	2030	2031																																														
Opening Enrolment	122	203	277	362	431	509	591	648																																														
LTE Capacity	780	780	780	780	780	780	780	780																																														
Peak Capacity	980	980	980	980	980	980	980	980																																														
ECEC	130	130	130	130	130	130	130	130																																														
Staffing Configuration	The following are expected numbers for both Teaching and Non-Teaching Staff under the current Enterprise Agreements (2019-2022) Complete table below (Refer to Part B Functional Brief, 1.7.11 Vehicle Parking) <table><tr><td></td><td>Total Staff Estimate</td></tr><tr><td>Opening Enrolment</td><td>15</td></tr><tr><td>Peak Enrolment</td><td>85</td></tr><tr><td>Long Term Enrolment (LTE)</td><td>65</td></tr></table> A further breakdown of staff types can be determined if required. Note: Staffing numbers do not include the staff required for the ECEC. Numbers for this space will be determined by statutory and regulatory requirements.										Total Staff Estimate	Opening Enrolment	15	Peak Enrolment	85	Long Term Enrolment (LTE)	65																																					
	Total Staff Estimate																																																					
Opening Enrolment	15																																																					
Peak Enrolment	85																																																					
Long Term Enrolment (LTE)	65																																																					
School Principal	School Principal will be appointed in early 2024.																																																					
Project Aims and Objectives	The detailed design development and construction of a new ECEC – Year 6 School in Strathnairn. A Development Application (DA) will be required for this project. The DA process will the responsibility of the Head Contractor.																																																					
Site																																																						

Site Details	The proposed school site is currently subject to an Estate Development Plan (EDP) which was finalised and lodged to EPSDD by the Estate Developers in November 2022. Block and Section numbers: Block 5, Section 37. Note – This will be subject to change once the EDP is finalised. Street address: The proposed school site is surrounded by Pro Hart Avenue, McClymont Way and Asimus Avenue. Total Site area: Proposed school site is 49,380 m², noting the final site area to be set during the EDP.
Existing Site Configuration and Constraints	The proposed school site is currently subject to an Estate Development Plan (EDP) which was finalised and lodged to EPSDD by the Estate Developers in November 2022. As identified in the EDP, there is a significant storm water outlet which is proposed to run through the school site to the west, this will run from the McClymont Way extension to the water treatment pond. These works will be undertaken by the developers as part of the EDP. Water Sensitive Urban Design (WSUD) has been incorporated into preliminary sketch plans. The proposed school site falls within a bushfire abatement zone and therefore is required to have an Asset Protection Zone (APZ) which is being confirmed as part of the EDP.
Concurrent Works	Currently there will be no concurrent works on the proposed school site, however this is subject to change pending the storm water works to be completed by the developer. Noting there will be road works and surrounding works around the proposed school site.
Design	
Cultural Integrity	The Territory and the Education Directorate (EDU), in particular, actively supports recognition of indigenous identity and culture in the student population and seeks provision of culturally specific design elements, spaces or facilities within the project. Consultation surrounding proposed design and construction elements is required during the full contract period. The ACT Government launched the Aboriginal and Torres Strait Islander Procurement Policy (ATSIPP) on 31 May 2019. The Government's aim for the ATSIPP is to support the objectives of the Aboriginal and Torres Strait Islander Agreement 2019-2028. This Agreement includes the focus area of employment and economic participation for Aboriginal and Torres Strait Islander Peoples in the Canberra Region. The Tenderer shall identify and encourage opportunities for indigenous management, staff and sub-consultants during the design and construction of this project.
Sustainable Design	Government is committed to leading by example. Government will implement a user-friendly sustainable procurement approach that ensures greenhouse gas and adaptation outcomes are considered in all procurement decisions. The Territory will ensure that capital works projects over \$10 million achieve or are consistent with an independent sustainability rating. New school facilities are required to be designed in accordance with the relevant National Construction Code (NCC) and Australian Standards, as well as in accordance with the Environmentally Sustainable Design criteria detailed in the EDIS documentation suite. Designs must be capable of achieving a 4-star Greenstar ratings and identify costed opportunities for delivering a design capable of achieving a 5-star Greenstar rating. Other requirements: • Water sensitive urban design • Tenderers should be aware of the Ginninderry Developments sustainability visions and requirements.

Project Criteria	Specific Design	Detailed design development and construction of an Early Childhood Education Centre (ECEC) for 130 students and four stream (4P) Preschool to Year 6 facility for 780 LTE students and associated staff, with provision for future expansion if required as defined in the EDIS suite of documents. • Early Childhood Education and Care (ECEC) incorporating all statutory requirements, with integration with the Preschool Learning Community • Preschool Learning Community with integration to Junior Primary School Learning Community as well as ECEC • Primary School Learning Communities incorporating integrated learning • Small Group Programs integrated into Primary School Learning Communities • Teacher workspaces integrated into ECEC, Preschool and Primary School Learning Communities • Facilities to support STEAM (Science, Technology, Engineering, Arts and Mathematics) • Facilities to support Food Technology at a P – 6 level integrated within the STEAM facilities • Facilities to support Music and Drama at a P – 6 level • Facilities to support learning in Health and Physical Education provided in indoor (Gymnasium) and outdoor settings (sports field, hard court/s, play equipment) • Leadership, Administration, Psychologist, Multi-Faith room and Staff Centre • Library/ Interactive Learning Resource • Outdoor learning areas and outdoor settings for performance/ play/ passive recreation and socialising areas for students and staff • Furniture, Fittings and Equipment • Information and Communication Technology (ICT) Infrastructure and Equipment • Social and recreation areas for students and staff • Canteen • Student and staff amenities, including non-gender specific amenities • Bicycle parking and storage • Suitable on-site car parking, which can also service community use, including by sports groups that access the school facilities outside school hours All school facilities are to be designed to maximise community use. This extends to the design of school security fencing that will aim to protect building assets without limiting access to the key community facilities, so they can be readily utilised outside of school hours. 3D images/fly through of the final design.
Provision for Future Growth – Modular Learning Centres (MLC)		If required, the future Modular Learning Centre (MLC) works are expected to include one General Learning Setting (GLS) for 200 Students with the following: • Building configuration and areas compatible with the Technical Specifications as well as to match the permanent building as much as possible • Student and Staff toilet amenities located in an extension to adjoining permanent building(s)

	• All site utilities and engineering services shall be in-ground with associated sub-metering terminated into secure ground pits to facilitate later connection • All ICT services • Landscaping • External learning areas including covered areas and covered walkways • Site access for development and removal at the end of the required period • Security fencing to be extended to integrate the additional building/s into the fenced school site area (dependant on where the building/s is located) • If more than one building is utilised, configure buildings to facilitate interaction on a single level between each structure to operate as one General Learning Setting. Note: Modular Learning Centres shall be connected to permanent buildings by an all-weather sheltered walkway, access ramps, stairs and concrete paths to provide all weather circulation between buildings.
School Operations	
School specific programmes	In the ACT every child and young person will benefit from a high quality, accessible education and childcare system. There are no specific programs for this project other than the requirements described in the RFT.
Vocational Education (VET) (High School and College only)	N/A
Community use	All school facilities are to be designed to maximise community use. School facilities that will be made available for out of school hours use by community groups include: 1. Gymnasium 2. Community room 3. External hardcourt/s and kickabout space 4. External learning environments and fixed play equipment 5. Out of hours car parking 6. Other community group hires
Other Commercial Arrangements	EDU and the School will manage particular community and/or commercial services arrangements that will utilise particular school buildings during and after school hours: • ECEC operator • Before and After School Care • Canteen operator • Waste management • Other community groups
Security	Details of the incumbent EDU contractors that the Contractor will need to interface with: • Security Monitoring – Leader Security • Out of hours emergency Maintenance – ACT Property Services and their contracted service providers.
Consultation	
EDU	• Infrastructure and Capital Works (ICW) • Enrolments and Planning • School Operations • Early Childhood Policy

Other ACT Government	• Major Projects Canberra, Infrastructure Delivery Partners (IDP) • Chief Minister, Treasury and Economic Development Directorate (CMTEDD) – Digital, Data and Technology Solutions (DDTS) • Environment, Planning and Sustainable Development Directorate (EPSDD) • Transport Canberra and City Services (TCCS) • Suburban Land Agency (SLA)
Approvals	• EGC Planning Subcommittee • Education Capital Works Steering Committee
Communication Deliverables	
EDU	• Senior Director, School Infrastructure Management, ICW • Senior Director, Assets Strategies
School and Community Comms plan	Communication to date has involved EDU Infrastructure Capital Works (ICW) and Enrolments & Planning (E&P), CMTEDD Treasury, Major Projects Canberra (MPC), Riverview Developments and Suburban Land Agency (SLA). Planned consultation during the design development phase and construction phase will include: • Strathnairn and Ginninderry community • Riverview Developments • Suburban Land Agency (SLA) – Mingle Group
Project Signage	Site signage must meet the ACT Government Signage requirements. Fence wrap design will be provided by the Contractor for approval prior to manufacture in accordance with the ACT Government 'Built for CBR' Guidelines. The Contractor will be responsible for procuring, installing and maintaining the Government "Built for CBR" fence wrap over the period of the contract.
Communication tools	Drone footage and timelapse photography is required to be arranged by the Head Contractor and shared with EDU for stakeholder communication purposes.
Development	
Development Application	A Development Application (DA) will be required for this project. The DA process will be the responsibility of the Head Contractor. Asset Acceptance is anticipated to be consulted during the DA pre-application meeting/s, however early engagement is encouraged.
Site Establishment	
Site Establishment	Design to consider location of site sheds, construction vehicle access, construction vehicle parking and site fencing



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Part B: Functional Brief

P-6 Primary Schools



Version 3.0 (Working Document 2021)

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1 Functional Specifications for ACT Public Primary Schools

All specifications and hence school design and construction are predicated on the fulfillment of one primary goal or function i.e. to facilitate the learning of its students to the highest quality.

The Directorate has implemented the Australian Curriculum as developed by the Australian Curriculum Assessment and Reporting Authority (ACARA).

1.1 Curriculum Requirements in Primary Schools

In Pre-School, the curriculum for is the Early Years learning Framework. The Framework describes the essential elements of high quality early childhood practice, including play. In Years K-6 the Australian Curriculum supports the deepening of knowledge, understanding and skills in all eight learning areas. Students also prepare for civic, social and economic participation and personal health and well-being. Outlined in *Appendix 3.2*.

Primary schools are responsible for implementing the Australian Curriculum stages of each of the Learning Areas from Foundation to Year 6. **The design of facilities that simultaneously support disciplinary based learning and interdisciplinary project based learning is important.**

The functional specifications for Primary School facilities are based on requirements of the Australian Curriculum and contemporary learning and teaching.

1.2 Contemporary Learning and Teaching (Pedagogy) in a Primary School

Pedagogy is the term used to describe the skills and methods teachers use to facilitate the learning of their students. Pedagogy in Primary Schools is characterised by an emphasis on collaboration, personalisation of learning and active inquiry within a supportive learning environment.

The expectations and demands on students, in terms of self-direction and self-management of learning, increase as they progress from Pre-School(P) through to Year 6. The use of digital technologies to access online media and resources for communication, learning and knowledge sharing and understanding is an integral aspect of Primary School education.

The need for all Learning Settings to support collaboration and a learning centred pedagogy has increased significantly. Students access and use ICT in a range of ways to enable and enrich learning, to communicate, research and access information and for creative expression.

Depending on the context, group sizes in a Learning Setting can range from individual to small, large and very large groups (see Section 2). In contemporary pedagogy the teaching-centric, single classroom models of industrial era schooling have given way to learning-centred models of pedagogy that require ease of flow between a variety of learning and teaching modes and hence a variety of Learning Spaces.

Strong relationships are fundamental for learning. Research demonstrates that relationships formed between students and teachers are a key determinant of the levels of student engagement in schooling and learning. When students experience a sense of belonging at school and supportive relationships with teachers and classmates, they are more motivated to participate actively and positively in their learning. It is also critical that teachers model and effectively teach effective communication and collaborative skills, to enable students to develop positive relationships with their peers. It is important that the learning environment reflects the school and teachers' commitment to building positive and productive learning communities.

Some students require additional support and a range of scaffolded learning experiences and opportunities to help them learn effectively and develop the capacity for further learning. In every class, students have different abilities, learn at different paces, learn in different ways, backgrounds, prior knowledge, interests, and experiences. The pedagogical strategy to cater for this is called **Differentiation**.

Success for all students relies on teachers being able to differentiate i.e. flexible delivery and make adjustments to the curriculum to suit, therefore **Personalising the learning** for students. As such, **a contemporary learning environment supports Teachers to differentiate for their students.**

To achieve this, building design needs to enable flexibility within the space; the ability to open and close areas to cater for need, spill out and collaborative spaces, areas for larger groups to work cooperatively, adequate space to promote positive learning and social outcomes and most importantly, all with clear lines of sight for staff to be able to constantly monitor all that is going on.

For staff to achieve effective Differentiation they must collaborate with each other to share innovative practice in Professional Learning Communities (PLCs), including online collaborations. **A contemporary school design needs to promote opportunities for effective collaboration for the staff of the school.**

1.3 Creating Environments that support Contemporary Learning in a Primary School

Contemporary learning environments are very deliberately designed to support the approaches to 21st century learning and teaching.

Just as contemporary learning is different from conventional industrial era learning so too are contemporary learning environments different from the conventional small, enclosed classrooms (in the Primary setting this is approximately 60m²) with all desks and chairs in rows. Contemporary learning environments have fundamentally different design drivers.

Contemporary Primary School learning environments support and enable:

- collaboration between students
- collaboration between professionals
- personalised learning, which requires flexible, responsive grouping of students — 1 to 1, 1 teacher working small groups, students working without direct teacher involvement, self-directed learning
- learner self-regulation, self-direction and self-management
- holistic, authentic learning— purposeful, meaningful, personally significant, experiential, real projects
- assessment in context—while the learning is happening
- connectedness—with community, virtually locally and globally, within and across subjects
- seamless access to rich resources—digital, information, equipment, materials
- learning anytime, anywhere, with anyone

Fundamentally, to achieve this change in the learning for students and the pedagogy for the teachers the learning environment must provide more space, that is flexible and Agile in the ways it can be used, than we have before.

The approaches to learning and teaching will continue to evolve according to themes that have become evident over the last two decades hence the importance of the ability for the school to re-configure in the future.

Digital connectivity, digital learning

Digital learning is an integral part of the contemporary learning environment.

Digital technologies enable learning by:

- providing access to quality online resources and experts
- increasing the agency of the learners by placing access to learning in their hands
- supporting personalisation of learning
- providing real-time assessment and reporting of learning
- facilitating collaboration and connection
- enabling ease of sharing student's learning with their families

The rapidly changing nature of ICT and its pervasiveness in learning, creating, connecting and communicating, demands adaptable design solutions. Fifteen to 20 years ago computer labs became common in schools. Ten years ago, computer labs started to give way to distributed computer pods and desktops gave way to laptops. Currently the digital learning landscape is a mixture of mobile devices BYOD (bring your own device) and high-end, school desktops for projects involving photography or other AV media (this would be particularly relevant for Yrs. 4 to 6 students).

To support this vital capability the Facilities will include, as a minimum:

- reliable, high speed, high capacity wireless coverage in all administration areas and indoor and external learning environments
- a number of high-end desktops distributed through the Learning Communities intended for Yrs. 4 to 6 students
- Interactive Teaching Technology (ITT)
- AV display screens for small group collaboration, presentation and virtual conferencing
- data projection and a large projection wall for communal gathering areas display capacity and AV
- video conferencing capability for communication and collaboration locally and globally

The Design Shift

The shift to contemporary pedagogy requires a shift in building design to support it. This shift can be simply characterised by a number of elements:

1. **Different Learning Settings designed for the purpose of the learning within them**
2. **A variety of Learning Spaces**
3. **Larger spaces to allow for flexibility and ease of flow between a variety of learning and teaching modes**
4. **Clear lines of sight from, between and within the Learning Setting**

The shift initially resulted in open 'barn' like spaces, with little definition of particular spaces for different activities, and with very poor control over noise in the space. Aside from the significant acoustic issues, the spaces were not well designed to support different types of learning/teaching activities. Gradually, learning environment design has become informed and more learning settings are now carefully and purposefully designed and fitted out to support different learning activities.

Any design must show how a variety of Learning Settings and Spaces with:

- careful consideration of the types of learning settings that support different learning and teaching activities
- designing each setting with consideration of how the functional requirements will be delivered through layout, fitout, acoustic treatments, physical and visual connectivity of spaces, and supporting services (ICT, power, AV, lighting and indoor climate control)
- understanding that some settings have a specific function while other settings can and will be used for a variety of activities
- understanding that some learning settings are in high demand and ensuring that the design will meet demand across the school

A common misconception has been the interpretation that explicit teaching spaces (classrooms) are no longer required, they are still an essential component of a contemporary learning setting. It simply means that consideration is given to a variation of size and their connection to the other Learning Spaces e.g. through the use of glass walls and doors, so that they are no longer a "single cell" but connected to the whole Learning Setting. **This is illustrated in Section 2, The Primary Learning Community.**

Section 2.5 of the EDIS Introduction describes the ACT Education Directorate's position on Learning Space Design best practice.

1.4 Operation of a Public Primary School

1.4.1 School Descriptor – Pre-School to Year 6 Primary School

Public Primary Schools in Canberra provide **Pre-School education** and **Primary School education** for learners from the age of four years (birthday before April 30). Since 2008, a P–6 school consists of an integrated Pre-School component and a Primary School component. A public Pre-School is an integral part of the P–6 school and is led and administered by the School Principal, the Leadership Team and the school Administration Staff. The Pre-School component of a P–6 school provides early childhood education for 4 year olds for 15 hours per week. The Primary School provides Kindergarten – Year 6 education from age five years (birthday before April 30) for up to 30 hours per week.

Many existing Pre-Schools in Canberra are being co-located with a Primary School. This is a legacy of past policy. The design of all new P–6 public schools in Canberra incorporate a Pre-School Learning Community as an integral part of the school while maintaining a distinct early childhood character and identity.

Early childhood education recognises that children's learning happens from birth, and those working with children in professional settings have an important role to play in enhancing children's learning and development. This can occur through intentional teaching moments during children's play, as well as through typical 'care' practices, such as toileting and meal routines. Public Pre-Schools in Canberra are an element of a comprehensive array of programs that support children's early learning thus building family and community capacity. The array of programs includes long day care, family day care, and public Pre-Schools. There are high levels of family engagement and involvement. Parents bring children into rooms, often with siblings in prams, in the morning and often stay during the first 10-15 minutes of each day.

Primary school marks the beginning of a child's life that is devoted to compulsory education. As such it plays a crucial role in introducing children to formal learning programs. A child's experience of learning at primary school has a lifelong impact on their attitude, disposition and self-concept as a learner. Primary school education provides the foundation for learning for life. It shapes children's expectations of learning success, their expectations of what

learning is for, their capabilities and responsibilities as a learner and how learning and teaching interrelate.

For schools to be designed using this Functional Brief, details of the Long Term and forecast Peak Enrolments are detailed in *EDIS Part A – Project Specific Requirements*. The section also provides clarification of the number of students that will be accommodated in permanent facilities.

1.4.2 Primary School Organisational Structures

The timetabled hours are typically 9.00 am – 3:00 pm with students arriving at school from 8.30am onwards, this may vary according to local circumstances and individual school arrangements. The schools operate on a four term year each of 10 weeks. The summer holidays are from late December through to late January with three two-week breaks during the year in April, June/July and in September/October. Early Childhood Schools are generally open for 51 weeks per year, opening hours between 7.00 am and closed at 6 pm daily.

In addition, school use of the Facilities will routinely extend beyond the hours specified above, including during holiday periods, for activities such as before and after school care, holiday programs, staff work/preparation, music tuition, student sporting matches and club activities, student and community sports groups, parent interviews and counselling, staff meetings and School Board and Parents and Citizens Association meetings.

Effective design of contemporary learning environments requires an understanding of the daily operation of Learning Neighbourhoods and Learning Communities.

The amount of time students spend in the Learning Neighbourhoods varies between schools. Generally, in Pre-School students spend approximately 90 - 100% of their time in the Learning Neighbourhood Settings, including the outdoor learning spaces. In Years K-6 students spend approximately 70 - 90% of their time in the Learning Communities with the remainder of the time across all of the specialist spaces e.g. Library, STEM, Food or PE.

Primary School students are taught by a team of teachers, therefore operational and organisational systems and structures are put in place to facilitate the support of both learning, social and wellbeing needs of the students. Strategies and approaches used by schools to support both learning and wellbeing needs include home groups, home group teachers, mentor groups and teaching teams.

Primary Schools adopt a range of different operational systems and organisational structures depending on the school's vision and philosophy, the needs of the students and the size of the school. Typically, in the ACT, Primary Schools are organised horizontally (in year groups) for the student cohort and for teaching staff. Class groupings typically comprise of either a single year group e.g. all students in Yr. 1 (often referred to as "straight" class grouping) or two or more year groups e.g. Yrs. 1 & 2 or 4, 5 & 6 (referred to as "composite" class grouping). Other Primary School structures may include Sub-schools or Houses. These can be organised in different groupings of year levels e.g. a vertical grouping (K-6 year levels). Generally, a team of teachers will be attached to a sub-school and spend a large proportion of their teaching allocation with students who belong to the sub-school.

Houses include students from Years K–6 and a team of teachers who belong to a House. Predominantly in the ACT, Houses are used for student engagement purposes and to deliver pastoral care programs.

Primary Schools may also employ a number of specialist teachers in curriculum areas such as Languages, Library or PE. These staff provide specialised curriculum while also providing the required release time for the general Primary teachers.

The other significant driver for the organisation of a Primary School is allocation of the teaching staff, this is dependent on availability of staff and the mandated hours for face-to-face teaching in the current Enterprise Agreement (EA).

1.4.3 Primary School Administration

There are many factors to the administration load for a school. Many of these factors relate to the sector of school i.e. Primary, High, Senior College or Specialist School.

In a Primary School this administrative work is performed in the General Office area. (refer Section 2).

1.4.4 Additional to the Core Student Hours

School use of the Facilities will most days extend beyond timetabled hours, including during holiday periods, for activities such as tutorials, staff work / preparation, instrument tuition, student sporting matches and club activities, parent interviews, staff meetings and School Board and Parents and Citizens Association meetings. Typically, between 3.30pm– 9.00pm.

1.4.5 Before and After School Care

The regulations for facilities that can be used for Before and After School Care are covered by the Education and Care Services National Regulations.

Schools designed according to the ACT Education Design Principles and Education Facilities Design Principles (Universal Design, design of External Learning Environments, and ACT Functional Areas and units) Brief and related Output Specifications will automatically satisfy the Education and Care Services National Regulations. It will be up to the provider of the Before and After School Care to negotiate with the Principal which facilities can be used and at what time.

The design must provide the school with choices for space that can support the delivery of a Before and After School Care Program. Some schools may find there is a community benefit in having the Multipurpose Hall available for community use directly after school, and so the design must provide (within the area allocations) at least one alternative zone where the Functional Requirements for Before and After School Care are met.

To facilitate smooth transition between school use and Before and After School Care use, the Functional Brief specifies a kitchenette function in the foyer of the Multipurpose Hall. Inclusion of storage for related equipment and a small office area are required for the Before and After School Care provider.

1.4.6 Community Use of Facilities

The ACT Government values the increased utilisation of educational facilities outside normal school hours. Opportunities to design facilities with reference to the broader community context and foster joint use arrangements, sharing and community access for use outside school hours should be explored. Parents and other community members should feel that they are welcomed and valued at the school and spaces must be available for parents to gather and meet without creating any educational limitations for the school.

Several Functional Areas have traditionally been briefed for possible shared use with the Community.

- The Learning Resource Centre
- The General purpose Hall
- The Community Room
- Hard courts and sports fields

Where facilities are proposed for community use, the design must prioritise the use by the school as learning facilities and that the community use does not present any limitations for operation on the school. Other consideration must also be given to providing for their use as stand-alone facilities that are able to be opened in isolation from adjacent secure unoccupied school areas. Provision must be made for direct paths of entry that do not rely on community members travelling through adjacent unoccupied and secured school spaces. Provision is to be made for services including heating, ventilation and cooling and lighting in these spaces to operate independently from the main school facility to maximise energy efficiency both during school hours (as an intermittently used space) and for after hour community use.

1.5 School Size

The size and configuration of an ACT Primary School is dependent on the following factors:

1. Maximum student numbers per class group for Years K-6 are mandated by the Enterprise Agreement (EA) and for Pre-school by National standards as follows:
 - 22 students/Pre-School session(class)
 - 21 students/class for K-3
 - 30 students/class for 4-6
2. ACT EDU policy dictates that:
 - All Priority Enrolment Area (PEA) students are able to attend local primary school
 - All students (irrespective of PEA) are able to continue at the school they were enrolled for Pre-school
3. National, international research and current ACT data for the achievement of **high quality** learning, social, well-being and industrial outcomes for students and staff.

These sizes describe the maximum Long Term Enrolment (LTE), i.e. the average enrolment figure that accommodates the natural fluctuation of enrolment over a 15 to 25 year cycle. It is important to note that this is **not the peak enrolment figure** for the school. See section 1.5.1 for this information.

As such, area allocation has been provided for three sized schools:

- 2 optimal sized schools:
 - A Primary School with 3 Pre-School sessions(3P) and a Capacity of 585 students
 - A Primary School with 4 Pre-School sessions(4P) and a Capacity of 780 students
- A larger sized school, a Primary School with 5 Pre-School sessions(5P) and a Capacity of 975 students

The move to contemporary designs for schools has brought with it the need to revise the manner in which area allocations or schedule of accommodation are determined. To inform design, the Schedule of Accommodation has been provided the **Minimum Nett allocation** for the various Functional Areas and as a specified area allocation for individual rooms.

1.5.1 Peak Enrolment

The Peak Enrolment for a school is the predicted maximum enrolment for that particular school. In this context, relocatable buildings (RLUs) are used to provide the educational infrastructure for students and staff for shorter-term situations when the enrolment rises and falls to and from its peak. These enrolment spikes can extend for a number of years. Relocatable buildings will have a manufacturer's standard building envelope design. The number of transportable buildings required will differ according to the demographics of particular sites. **Master planning must consider and identify locations on the site for the relocatable buildings that ensure integration with the permanent and modular buildings.** The education facilities design principles (Appendix 3.1) apply equally to transportable buildings and their layout arrangements as they do to the design and layout of permanent buildings. **The interior of the relocatable buildings must be fitted out to provide the functionalities briefed for the permanent buildings** of equivalent function.

1.5.2 School Expansions

The expansion of a school is to cater for the additional educational requirements when the predicted LTE is exceeded and is less than the maximum LTE described in section 1.5. In this context, a tailored solution that includes either permanent buildings, modular buildings or a combination should be determined. Modular buildings are prefabricated buildings purpose designed to provide the necessary Learning Settings to cater for students and staff when enrolments are expected to exceed long-term enrolments for an extended period of 25 plus years. Modular buildings **must be designed to complement the design of the permanent build Learning Settings.** The layout of the modular buildings on the site and the internal fitout of modular buildings must be integrated into the site masterplan and the overall school design and must include the same functionalities and amenities that are briefed for the permanent Learning Settings.

1.6 Co-located Schools

Co-located school are different sector schools (Primary, High, College or Specialist) that are built on adjacent or adjoining land. **In this case the co-located schools are to be built individually in accordance with the relevant functional brief for each sector.** There may be some opportunities to share some externally facilities e.g. sports oval. *Refer to EDIS Part A -Project Specific Requirements.*

1.7 Functional Specifications

The Facilities design must:

- support the Education Principles derived from the Directorate's vision, values and priorities
- be underpinned by the Education Facilities Design Principles outlined in *Appendix 3.1*
- incorporate Universal Design Principles
- incorporate Responsive Design Principles to allow future re-configuration
- incorporate Sustainable Design Principles
- address the Architectural Design Principles presented in *EDIS Part C Masterplanning and Architectural Specification*
- enable the successful delivery of the Australian Curriculum at each stage of education
- support the Directorate's position on pedagogy
- meet the functional specifications as outlined in *section 2*
- comply with applicable legislation, codes, standards and regulations
- meet other educational and non-educational requirements as set out in *EDIS, Part A – Project Specific Requirements*.

1.7.1 Definition of Terms

The replacement of the traditional school designs has been accompanied by the development of a number of new terms to describe aspects of contemporary learning environments. A list of terms used in this Functional Brief, and their definitions are included in *Table 2* below.

Table 2: Definition of terms for contemporary learning environments

Terms related to Function:

Functionality — a purpose, intent, expectation.

Functional Areas — physical buildings, internal spaces and external areas that serve or accommodate related functions, e.g. Administration area, Learning Community, Specialised Learning Settings, General Purpose Hall.

Functional Units — spaces within a Functional Area that serve identified functions e.g. reception within the Administration area, Staff Workspace within Learning Communities.

Functional Elements — sinks, benches, display areas, storage facilities, fixed seating, etc.

Terms related to the Learning Environments:

Learning Community — the general term Learning Community refers to an organisational grouping of learners and teachers. The size of a Learning Community varies with the size of the school. Individual schools will adopt the organisational structure to suit the needs of their student population and community. Hence the cohorts of students and staff using the Learning Communities identified will vary from school to school.

Learning Neighbourhood — a Learning Neighbourhood is a subset of a Learning Community. A Learning Neighbourhood acts as the 'learning home' for a group of learners with a team of teachers. A 'learning home' signifies a personal place/space for students where they locate their belongings, relate to a teacher(s) with primary responsibility for their learning progress and wellbeing, and where they connect with the group of other learners who share the 'learning home'. In contemporary learning environments, many resources and learning spaces are shared within a Learning Neighbourhood.

The Learning Neighbourhood is an area that contains a number of Learning Spaces that support a range of related uses as outlined in Section 2 e.g. in a Primary School this could be one or more year groups.

Learning Setting — a learning setting is essentially a Functional Unit designed specifically for different learning and teaching activities. A learning setting is an area configured and fitted out with furniture and equipment (including digital media) to support one or more related learning activities. An outdoor learning setting that is fitted out to support learning activities such as construction, or quiet reading, a playground setting that provides structures which promote gross motor development.

Specialised Learning Setting (SLS) applies to an area that is designed for a limited range of purposes that require specialised equipment, fit out and/or special operational conditions e.g. a STEAM Laboratory, Music studio, or Food kitchen.

Multi-purpose Learning Setting (MLS) describes an area that can have a range of uses and users, e.g. the General Purpose Hall can be used for, PE, Music, Dance and Drama education, school gatherings, assemblies and ceremonies.

Learning Space describes an Agile space within the Learning Setting that is able to accommodate a variety of different sized groups of students and can support multiple modes of learning activities. For example, Explicit Teaching Spaces or smaller Learning Spaces

Meeting Room describes a separate room within a Functional Area that is able to accommodate a group of students or staff that provides acoustic and/or visual (dependant on purpose) privacy.

Terms related to school organisational models:

Sub-school – is an organisational structure adopted by some schools to group students in bands of year groups, for example in Primary Schools – Year 4–6, with a team of teachers who have responsibility for the learning and wellbeing of the students in that sub-school.

House – is an organisational structure adopted by some schools to group students, usually in vertical age groups with a team of teachers who have responsibility for the learning and wellbeing of the students in that group. Houses are also commonly used for student engagement purposes.

General terms related to adaptability and reconfigurability:

Adaptable means that spaces and/or furniture can be re-arranged by the users for day-to-day use without specialised help or any re-construction.

An **Agile Space**, setting or element implies that **re-arrangement can occur in less than 5 minutes** to suit different activities e.g. furniture that can be arranged for a medium sized group can be re-arranged quickly for collaboration in pairs, a mobile resource storage element can be moved readily from one area of a space to another 10 – 20 metres away, a glass door that can quickly connect or separate adjacent spaces.

An **Activated Space** or Learning Setting is purposefully set up with furniture, displays, resources or equipment for students to use. An activated space is the antithesis of an ‘open-barn’ learning environment.

Re-configurable means that the internal configuration of spaces and services can be altered at minimum cost to accommodate changing needs that result from new learning technology, curriculum changes and/or changing demands for use that might occur over the long term.

Other:

Minimum Nett Areas provide a minimum area required to address the specified functionalities. Nett Area refers to the usable space within the Functional Area described i.e. it does not include internal walls, doors or fittings.

1.7.2 Functional Areas for a P–6 Primary School

Primary School Functional Areas and Functional Units consist of indoor and outdoor areas for learning, social, active and passive recreational areas, administration and support areas for students and staff. Functional Areas can serve a range of uses and a variety of users:

- whole school use, (e.g. Learning resource centre)
- whole school focus, (e.g. Administration and Leadership Centre)
- largely used by a particular group of learners or staff (e.g. Learning Communities, Staff Lounge)
- specialist facilities with specific equipment or conditions of use (e.g. STEAM Lab or Music Room)
- shared use facilities for use by the school and by the community

It is important to note that the Functional Areas listed below refer to an area, or areas, in the school that serve related functions. The term **Functional Area does not necessarily imply one space, nor does it imply that an area has only one function** (Definition of Terms, Table 2).

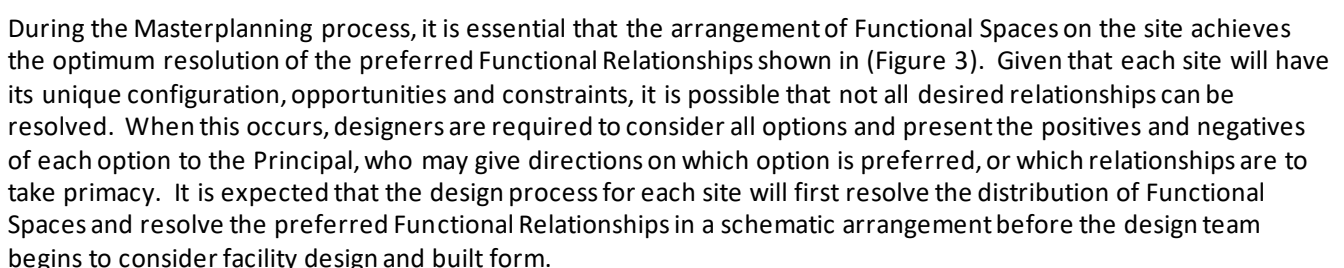
1.7.3 Essential Functional Areas and Functional Units for P–6

- Main **Administration** facilities that include the leadership spaces. This should be the main entrance for the school for all parents and other visitors, not for the students
- **Learning Resource Centre (Library)**
- **Learning Communities and Neighbourhoods** – for Pre-School and K-6
- **Community engagement space** – preferably connected to the Pre-school Learning Neighbourhood
- **Staff Workspaces** (that include a collaborative workspace) as an integral component of the Learning Communities

- #### 1.7.4 Functional Relationships for a Primary School

Figure 3: Primary School Functional Relationships

Direct connection: _____
Close Proximity: - - - - -



1.7.5 Minimum Nett Areas for Functional Areas and Functional Units

The summary of the Minimum Nett Area allocation for the Functional Areas are provided in Table 3. These areas have been determined through analysis and testing of the area required to achieve the required functionalities for the number of students that make up the long-term enrolment (LTE) of the school. **Nett Area refers to the usable space within the Functional Area described i.e. it does not include internal walls, doors or fittings. This must be assumed in the design unless otherwise specifically stated in Section 2.**

It must be noted that Table 3 does not describe a P-6 Primary School –it describes the summaries of area to be invested in the design of the school. The school design must be derived from an understanding of the functional requirements of all functional spaces and the relationships that must be arranged between functional spaces.

Specific areas allocations are listed for each Functional Area in **Section 2: Detailed Functional Specifications for a Primary School.**

1.7.6 Engineering Plant and Equipment

The design must provide adequate area for plant and equipment. i.e. engineering, services, communication racks, switch boards etc. Each facility will require the provision of space to contain the required engineering and plant in the configurations and arrangements proposed. **The design must make provision for engineering space for building services, ICT, communications and similar needs without impact on or intrusion into space intended for other briefed functions.** Provide as necessary, rooms, ducts, cupboards or recessed proprietary cabinets for services including communications, mechanical switchboards, electrical switchboards, fire indicator panels and fire hose reel cupboards. *Refer to Part D – Technical Specifications.*

Consideration must be given to the required maintenance access to ensure that maintenance can be carried out in a safe, efficient manner without disruption to the other briefed functional areas. Engineering plant and building services equipment must be located so that it can be accessed without technicians needing to enter into educational or administration functional spaces.

1.7.7 Amenities Provision

Toilets

Refer to the Functional Unit descriptions for toilets, showers and other sanitary amenities under:

- Student Sanitary Amenities
- Staff Sanitary Amenities
- Hall – Sanitary Amenities
- Small Group Program

The general requirements are:

- Sanitary Amenities used by staff and other adults are not to be used by students and vice versa
- Provision must be provided for both gender specific and non-gender specific amenities
- Distribute toilets throughout the campus
- The overall number of sanitary Amenities required may be in excess of the minimum NCC requirement in order to satisfy all the schools requirements contained in this brief
- Specific Amenities requirements are necessary for the Small Group Program and the Hall
- Consider locating sanitary facility requirements for high demand areas to potentially reduce the overall number of fixtures required e.g. the Hall
- Allow for secure after-hours access to Amenities connected to areas used for after-hours community use separate from the remainder of the school

Cleaners' rooms

Cleaners' rooms must be distributed across the facilities to satisfy operational, storage and Work Health and Safety (WHS) requirements and to comply with EDU Guidelines. Please see section 2 for details.

1.7.8 Circulation

In contemporary designs, corridors are not as prevalent as they were in traditional school.

Circulation allocations has been provided in Table 3. This allocation can be used where corridors are required and can also be used to augment learning spaces and facilities where circulation paths are less defined however, adequate space is still required to support free flow circulation.

The minimum area provision for circulation shown in Table 3 is based on 17% of nett briefed permanent area for the individual Functional Areas. **This is to inform the design process, as the contractor must demonstrate that the design makes provision for students and staff to circulate around and through the facilities without adverse impact on adjacent functionalities, in particular those that relate to the primary purpose of teaching and learning.**

1.7.9 Other Internal Provision

The design must provide adequate area for a number of other internal serviceable requirements. **These provisions must be made as additional area and without adverse impact or intrusion into space intended for other briefed functions.** These provisions include:

- External and internal doors
- Airlocks

1.7.10 Bicycle Storage

The facility must be designed to support and encourage sustainable and healthy commuting by students, school staff and visitors as outlined by *The Transport Canberra Policy (2012)*. The facility must demonstrate compliance with the Bicycle Parking General Code, in particular with the requirements for provision of bicycle parking spaces for students, staff and visitors and the requirements for end-of-trip facilities provided for staff and students at “Educational establishments”.

Adequate secure, fenced and roofed bicycle/scooter storage is required for students and separately for staff, in locations convenient to users to access end-of-trip facilities on arrival and to access the neighbourhood bicycle path network on departure. Bicycle storage for school visitors should be provided proximate to the staff bicycle store.

1.7.11 Vehicle Parking

ACT Government principal reference documents for design requirements for vehicle parking include:

- the ACT Government’s Building an Integrated Transport Network – Parking (Parking Action Plan)
- the ACT Parking and Vehicular Access General Code

Schools experience periods of peak transport activity, at the start and finish of each school day. The development of the school site, and its interface with its bounding streets and local neighbourhood, must give consideration to measures that limit traffic congestion and facilitate the safe and efficient arrival and departure of students and staff regardless of their selected mode of travel. Consistent with the ACT Parking Action Plan, parking options at ACT schools will support safe school environments and increased active travel to school.

The development of the project site must consider and make provision for access, movement and parking of vehicles (in excess of the ACT Parking Code) that can reasonably be expected to approach adjacent to the school site or to enter the school site regularly or occasionally. This will include:

- Passenger vehicles used by staff, parked all day. The nature of the work at a Primary School significantly complicates the use of public transport for staff employed in this sector and as such the need for parking is greater than for other workplaces. This is primarily the amount of resources and student work taken home by staff. **As such, parking spaces need to be provided for 90% of the permanent staff employed for school LTE size.** Under the current Enterprise Agreements (EA) the total stall will be:
 - For a 3P School of 585 LTE approximately 45 staff
 - For a 4P School of 780 LTE approximately 65 staff
 - For a 5P School of 975 LTE approximately 85 staff
- **A dedicated carpark for the Pre-School that provides 30-minute short stay spaces for 16% of total LTE for the Pre-school** (this is for all Pre-School Sessions, see *EDIS, Part A*). I.e.:
 - 10 short stay spaces for a 3P school
 - 14 short stay spaces for a 4P school
 - 18 short stay spaces for a 5P school

This is to accommodate the Directorate’s requirement that all Pre-School students are escorted into and picked up from the school by an approved parent or carer

- Passenger vehicles used by visitors usually for a short stay
- Passenger vehicles used by parents/ carers for pick up/set down of all students
- Public transport buses both within the carpark area and using the local street network
- Taxis and hire cars
- Commercial vehicles entering the site by arrangement, including:
 - vehicles making deliveries to the Canteen, the School Administration, or the Facilities Management Centre
- Tradespersons vehicles for the purpose of grounds or building maintenance
- Waste collection vehicles
- Emergency vehicles (Ambulance, Fire Brigade or Police) who may require priority parking proximate to a point of entry into the Administration building or access to any external space

Further information on the project requirements for vehicle movement and vehicle parking is described in the *EDIS Part C – Masterplanning and Architectural Specification*.

1.8 Naming of the School and Functional Areas

A provisional name has been used to identify the school in the project documentation. The school name will be changed to better identify the school in its context.

The terminology used in the Output Specification for the functional areas and functional spaces should be used for all design documentation for consistency and review purposes. It is likely that names for some spaces and functions at the school will be changed by the appointed School Principal to better identify the purpose of these spaces within the school's individual education and resource management plan.

Table 3: Summary of Minimum Nett Areas for internal and external Functional Areas for an ACT Primary School

FUNCTIONAL AREAS – INTERNAL	Permanent facilities for a 3P School	Permanent facilities for a 4P School	Permanent facilities for a 5P School
Administration, Leadership and Staff Centre	484 m²	528 m²	581 m²
Reception/foyer	from Circulation	from Circulation	from Circulation
General Office	50 m ²	50 m ²	60 m ²
Administration Store	35 m ²	35 m ²	40 m ²
Uniform Store	10 m ²	10 m ²	10 m ²
Leadership Area	55 m ²	75 m ²	75 m ²
Business Manager's Office	15 m ²	15 m ²	15 m ²
Conference Room	30 m ²	30 m ²	30 m ²
Meeting Room(s)	12 m ²	12 m ²	24 m ²
School Psychologist office	15 m ²	15 m ²	15 m ²
Allied Support Staff Office	12 m ²	12 m ²	12 m ²
Multi-Faith Room	10 m ²	10 m ²	10 m ²
Staff Retreat Room	10 m ²	10 m ²	10 m ²
Staff Lounge	80 m ²	100 m ²	120 m ²
Sick Bay	25 m ²	25 m ²	25 m ²
Facilities Management Workroom	55 m ²	55 m ²	55 m ²
Circulation (excluding External Storage)	70 m ²	74 m ²	80 m ²
External Storage (located with Waste Facility)	20 m ²	20 m ²	20 m ²
Staff amenities (must be added to total)	Section 1.7.7	Section 1.7.7	Section 1.7.7
Learning Resource Centre (Library)	300 m²	360 m²	415 m²
Main Library Area (includes circulation)	200 m ²	250 m ²	300 m ²
Entry Foyer	10 m ²	10 m ²	10 m ²
Meeting / Conference Room	30 m ²	30 m ²	30 m ²
Virtual conference Room	15 m ²	15 m ²	15 m ²
Staff Office/ Work Area	30 m ²	40 m ²	40 m ²
Secure Storage	15 m ²	15 m ²	20 m ²
Pre School/Kindergarten (P/K) Learning Community	1,023 m²	1,153 m²	1,303 m²
Learning Community as described in Section 2	1,023 m ²	1,153 m ²	1,303 m ²
Staff and student amenities (must be added to total)	Section 1.7.7	Section 1.7.7	Section 1.7.7
3 x Primary Learning Communities (Yrs. 1-6)	2,781 m²	3,522 m²	4,371 m²
Each Learning Community (Section 2)	927 m ²	1,174 m ²	1,457 m ²
Staff and student amenities (must be added to total)	Section 1.7.7	Section 1.7.7	Section 1.7.7
Specialist Learning Settings: – Hall / Gymnasium	1,225 m²	1,235 m²	1,245 m²
Gymnasium (Single Competition)	825 m ²	825 m ²	825 m ²
Foyer	from Circulation	from Circulation	from Circulation
Stage	55 m ²	55 m ²	55 m ²
Chair Store	50 m ²	60 m ²	70 m ²

FUNCTIONAL AREAS – INTERNAL	Permanent facilities for a 3P School	Permanent facilities for a 4P School	Permanent facilities for a 5P School
Music Learning Space	80 m ²	80 m ²	80 m ²
Practice rooms	20 m ²	20 m ²	20 m ²
Music store	20 m ²	20 m ²	20 m ²
PE Store	50 m ²	50 m ²	50 m ²
Community Store	10 m ²	10 m ²	10 m ²
Change rooms (2)	60 m ²	60 m ²	60 m ²
Staff and Student amenities (must be added to total)	Section 1.7.7	Section 1.7.7	Section 1.7.7
Circulation (does not including gymnasium floor space)	55 m ²	55 m ²	55 m ²
Other Specialist Learning Settings:	350 m²	350 m²	450 m²
STEAM Laboratories (2) (see section 2)	180 m ²	180 m ²	180 m ²
STEAM Store	15 m ²	15 m ²	15 m ²
Food Technology Learning Space	90 m ²	90 m ²	90 m ²
Food Technology Store	10 m ²	10 m ²	10 m ²
Adaptable SpecialtySpace	-	-	100 m ²
Circulation	55 m ²	55 m ²	55 m ²
Canteen (including indoor servery area)	90 m²	90 m²	100 m²
Total Internal Functional Area (not including amenities or plant/engineering)	6,253 m²	7,238 m²	8,465 m²

FUNCTIONAL AREAS – EXTERNAL	Permanent facilities for a 3P School	Permanent facilities for a 4P School	Permanent facilities for a 5P School
External learning settings for Specialty Areas:			
Pre-School Fenced Play area	1 (750 m ²)	1 (1,000 m ²)	1 (1,000 m ²)
Small Group Program – Sensory courtyard	4	4	4
Fenced Hard Courts (with “run-off” space):			
Netball/Basketball	2	2	2
Futsal	1	1	1
Bike storage – students and staff	Refer section 1.7.10	Refer section 1.7.10	Refer section 1.7.10
Parking	Refer Section 1.7.11	Refer Section 1.7.11	Refer Section 1.7.11
Sports field (to include line marking and posts)	1 Rugby/Soccer	1 Rugby/Soccer	1 Rugby/Soccer
Passive playground areas with seating	600 m ² (1 m ² /std)	800 m ² (1 m ² /std)	1,000 m ² (1 m ² /std)
Shaded spaces (with seating) within Passive area	For 200 students	For 300 students	For 400 students
Active open informal games area(s) (Hard surface Quadrangle) [additional to hard courts and sports fields]	500 m ² (min)	600 m ² (min)	700 m ² (min)
Gathering and performance space(s)	1	1	1
External Circulation as required			

2 Detailed Functional Specifications for a P–6 Primary School

2.1 General Information

2.1.1 Contemporary Learning Environments for Students and Staff

The move to the design intent described in section 2 gives greater opportunity for innovative design responses, designers also face greater challenges in the process of designing contemporary learning environments. In the case of learning spaces and school learning environments the challenges involve understanding:

- the manner, and range of ways in which teachers work with students
- the operational realities such as patterns of use, efficiency of staffing, safety and security
- the function of each area as described in this Functional Brief
- the specific functional requirements for each Learning Setting
- the Integration of the functional specifications and requirements with the Technical Specifications, and providing a detailed and complete Furniture, Fitout, and Equipment schedule that will activate each room or space as required to achieve the function(s). This must also include the Building Management System (BMS) for the control of the learning areas

2.1.2 Functional Specifications for Functional Areas, Functional Units and Learning Settings

Functional Areas

Each Functional Area is described as follows:

- name of Functional Area
- section of the school it belongs to
- Minimum Nett Area allocation
- general overview of function
- Functional Units that make up the Functional Area
- operational factors to consider
- Functional Unit relationships

Functional Units

Each Functional Unit is described in detail as follows:

- name of Functional Unit
- the Functional Area in which it is located
- Minimum Nett Area allocation and area guidelines (which may vary as a factor of forecast enrolment numbers)
- design intent
- operational factors to consider
- general functional requirements
- specific functional requirements in terms of spatial layout, fit out, acoustics, visibility, ICT, security etc. with reference to related sections of the Technical Specifications

Where it is considered that illustrations would help develop an understanding of the functionality, drawings and photos are provided. These are **simply indicative of the concept** and, in general, are not put forward as the best design solution or as a recommended design approach.

Careful consideration needs to be given to ensuring all the functional relationships and specific requirements are met.

2.2 Primary Learning Communities

2.2.1 Overview

The general term 'Learning Community' refers to an organisational grouping of learners and teachers. The size of Learning Communities in a P–6 school varies depending on the organisational structure adopted by individual schools and/or the size of a particular cohort.

Learning Community buildings are occupied by students for the majority of their school day. It is in the design of the general learning environments where the difference between industrial era learning and contemporary, 21st Century learning is most obvious.

The Learning Neighbourhood is a subset of the Learning Community and acts as the physical learning home for a group of learners with a team of teachers. A 'learning home' signifies a personal place/space for students where they locate their belongings, relate to a teacher(s) with primary responsibility for their learning progress and wellbeing, where they connect with the group of other learners who share the 'learning home' and where their work, ideas and achievements are presented and celebrated.

Learning Neighbourhoods range in size and element composition according to the size of the school. In the ACT this is governed by a number of factors, see section 1.5, *School Size* for details.

For any size of Primary school a design which can be adapted to suit different organisational models is required within the mandated requirements.

Note that in contemporary learning environments, many components such as amenities, circulation and learning spaces are shared within a Learning Community and might be shared between adjacent Learning Communities depending on the design.

Each Primary School will have 4 Learning Communities. Each Learning Community will have 2 Learning Neighbourhoods.

One LC dedicated for Pre-School and Kindergarten each with specialised Learning Neighbourhoods
Three LCs, each with 2 Learning Neighbourhoods for Years 1 to 6

2.2.2 Pre-School / Kindergarten Learning Community

FUNCTIONAL AREA:	Pre-School and Kindergarten (P/K) Learning Community (LC)			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	Total m² / LC (see Table 4)	1,023	1,153	1,303

Overview

The Pre-School and Kindergarten stages of learning require specialised facilities and as such a dedicated Learning Community.

This Learning Community requires 2 Learning Neighbourhoods:

A Pre-School Neighbourhood and**A Kindergarten Neighbourhood**

The design of the Pre-School Neighbourhood must comply with the Australian Children's Education & Care Quality Authority National Quality Framework/Standards to ensure the facility is certified as an early childhood school.

The Learning Neighbourhoods range in size according to the size of the school. In the ACT this is governed by a number of factors, see *section 1.5, School Size* for details.

Table 4 outlines the Minimum Nett Floor Area required for the different sized schools.

Functional Units for the Learning Community

- Pre-School Learning Neighbourhood
- Kindergarten Learning Neighbourhood
- Staff Workspace that each include individual workstations, a collaborative workspace and a kitchenette
- One private meeting room without visibility
- Small Group Program
- Community room
- A Kitchen
- Office space for After School Care Program
- After School Care Program Storeroom
- Amenities for students and staff
- Staff Resources/Utilities room
- Integrated external learning settings

Specific requirements for these functional units are listed below in *Table 4*.

Operational factors to consider

The building that accommodates this Learning Community should be located:

- At ground level
- Direct access to separate external learning settings
- Direct connection to a separate carpark with drop off facilities – see *Vehicle Parking section 1.7.11*
- Adjacent to the Administration building

The ability to separate or open up between the Learning Neighbourhoods and adjoining external learning Spaces if required must also be incorporated.

The early childhood staff from both the Pre-School and Kindergarten Neighbourhoods work as a team and will share the workspace in this Learning Community.

The Community Room and the Office space for the After School Care Program should be located adjacent to the Pre-School Learning Neighbourhood with direct access to the foyer, Kitchen and close proximity to the amenities. An additional storeroom of 12m² is required for this program.

Table 4: Specific functional requirements of a P/K Learning Community

Functional Unit	Min. Nett Floor Areas for 3P School/LC	Min. Nett Floor Areas for 4P School/LC	Min. Nett Floor Areas for 5P School/LC
Pre-School Learning Neighbourhood	340 m ²	340 m ²	365 m ²
Kindergarten Learning Neighbourhood	360 m ²	480 m ²	600 m ²
Community Room	85 m ²	85 m ²	85 m ²
After School Care Program Office	12 m ²	12 m ²	12 m ²
After School Care Program Storeroom	12 m ²	12 m ²	12 m ²
Staff Workspace	60 m ² (section 2.2.5)	70 m ² (section 2.2.5)	80 m ² (section 2.2.5)
Small Group Program	65 m ² (section 2.2.4)	65 m ² (section 2.2.4)	65 m ² (section 2.2.4)
Private Meeting Room	15 m ² (section 2.4.1, P.71)	15 m ² (section 2.4.1, P.71)	15 m ² (section 2.4.1, P.71)
LC Storeroom	15 m ²	15 m ²	25 m ²
Staff Resources/ Utilities Room	12 m ² (section 2.2.6)	12 m ² (section 2.2.6)	12 m ² (section 2.2.6)
Circulation for other spaces (excludes both Learning Neighbourhoods) Including: • Student bags storage and Display areas	47 m ²	47 m ²	47 m ²
Amenities must be added to total: • Student and Staff Toilets • DDA compliant Toilet • Cleaners room	Section 1.7.7	Section 1.7.7	Section 1.7.7
Total for LC	1,023 m²	1,153 m²	1,303 m²

Figure 4: Functional Relationship diagram – P/K LC

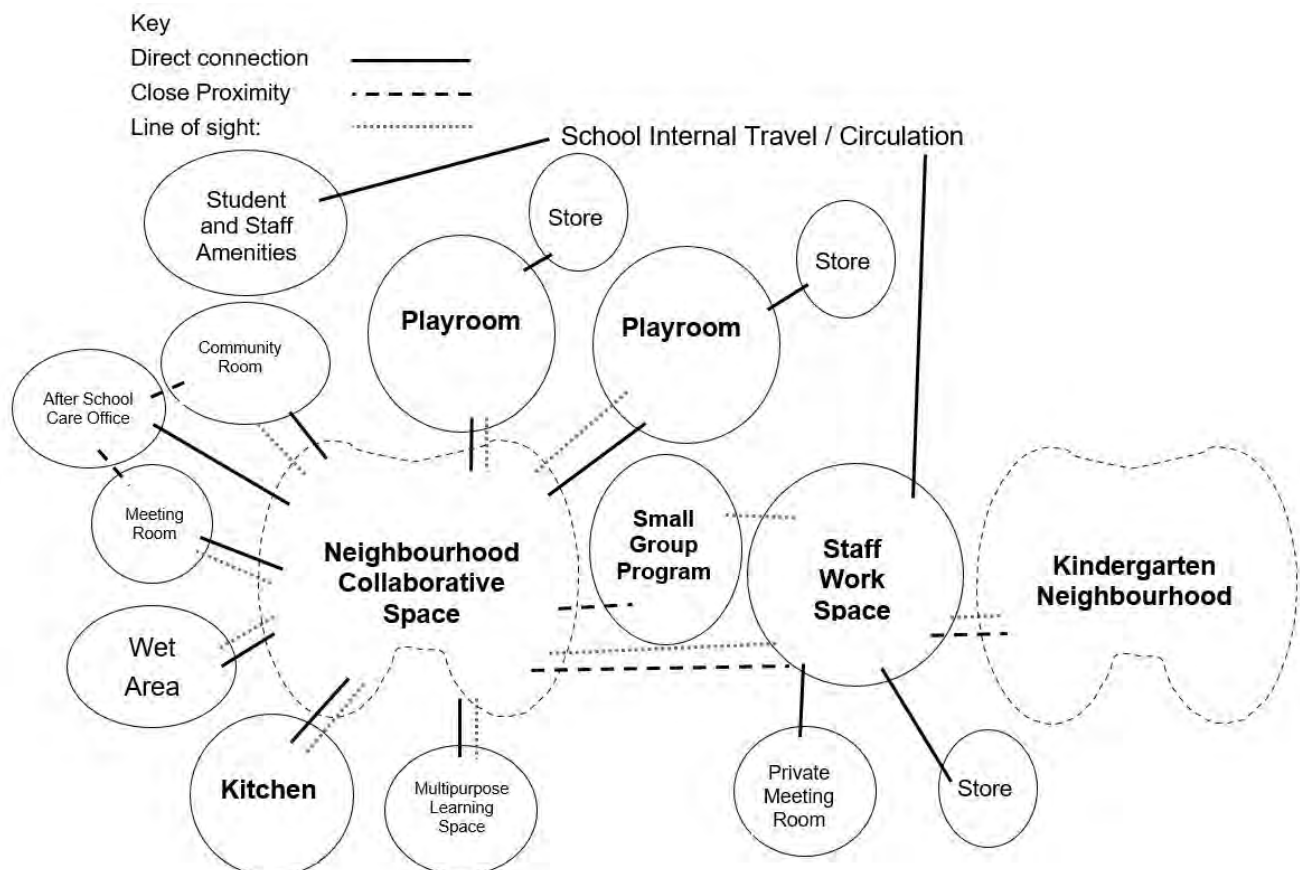
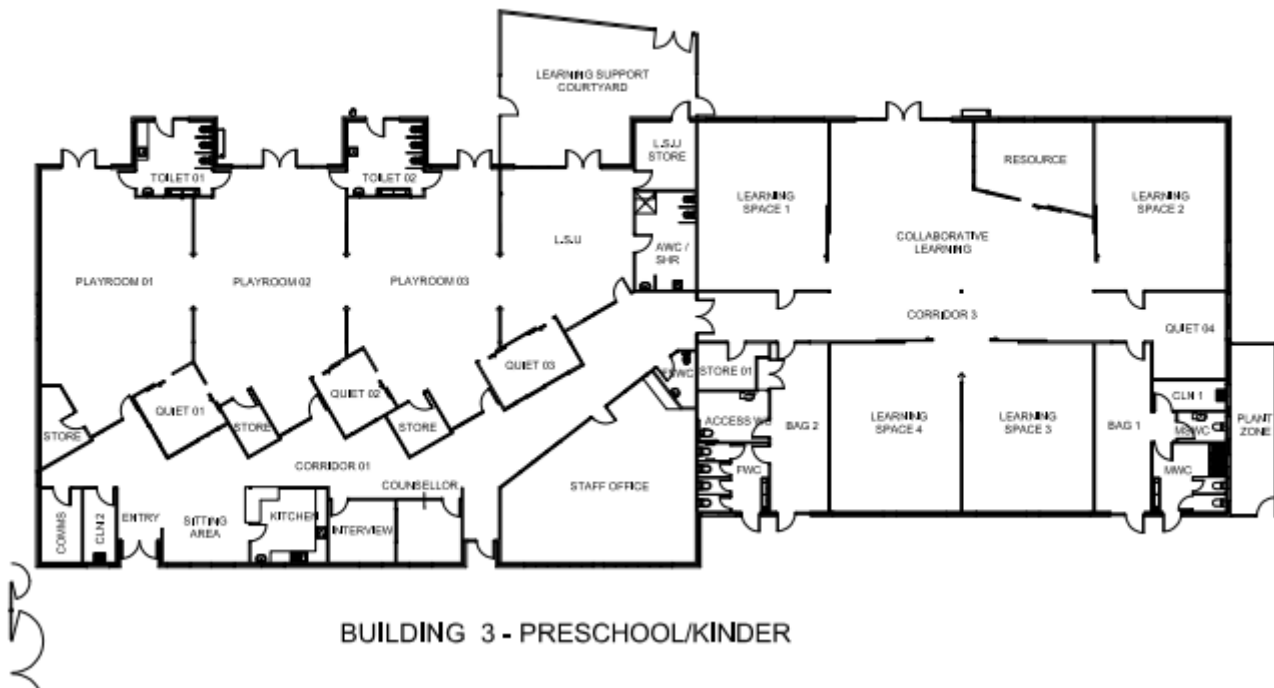


Figure 5:

Design of a Pre-School and Kindergarten Learning Community for a 4P school*ACT Public School: Charles Weston School*

This is an LC for a 4P School that shows:

- Explicit teaching spaces that can be either opened up or closed down easily by staff to create the different sizes of learning spaces including a large collaborative space
- “Playroom 01” that is adaptable as a community space
- Uses glass sliding doors to achieve line of sight, acoustic integrity and security requirements
- Central Staff Workspace, with clear sight lines, that has a collaborative space for staff
- Storeroom next to Staff Workspace and further storage in the Staff Workspace
- Agile Quiet Spaces
- A private Meeting Room with walls
- Purposeful use of circulation space
- Clear internal travel paths between Neighbourhoods

FUNCTIONAL AREA:	Pre-School (P) Learning Neighbourhood (LN)			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	Total m² / LC (see Table 5)	340	340	365

Overview

Since 2008, Pre-Schools in Canberra are operated as an integral part of a P–6 Primary School. This enables a seamless transition from Pre-School to Primary school and is a hallmark of the ACT Public Education System. Play is the crucial medium for learning in the Pre-School and therefore must dominate the design in this area. The design of the Pre-School Neighbourhood must comply with the Australian Children's Education & Care Quality Authority National Quality Framework/Standards (NQF) to ensure the facility is certified as an early childhood school. The Framework can be located at: <https://www.acecqa.gov.au/nqf/about>

Functional Units for a Pre-School Learning Neighbourhood

- Foyer / Entrance area
- Meeting room
- Playrooms
- Quiet Learning spaces
- Kitchen
- Internal Bag storage for student bags
- Storage for resources
- Amenities for students
- Integrated external learning settings

Individual room data sheets are provided for the above Functional Units

Operational factors to consider

The entry to the Pre-School must be in close proximity to the main entrance yet be accessed without having to go past Reception. Parents arriving to pick up or drop off their children will often have younger children with them. Consideration should be given to potential congestion issues and circulation that can accommodate prams, strollers, toddlers travelling in both directions.

The design must facilitate supervision of the Pre-School children by staff at all times.

While the external learning and play area for Pre-School is required to be fenced, ready access to the Kindergarten external learning and play area is required to enable easy transition.

Table 5: Specific functional requirements of a Pre-School Learning Neighbourhood

Functional Unit	Min. Nett Floor Areas for 3P School/LC	Min. Nett Floor Areas for 4P School/LC	Min. Nett Floor Areas for 5P School/LC
Foyer / Entrance	30 m ²	30 m ²	30 m ²
Playrooms	170 m ² (2 @ 85 m ²)	170 m ² (2 @ 85 m ²)	170 m ² (2 @ 85 m ²)
Quiet Learning Spaces	30 m ² (2 @ 15 m ²)	30 m ² (2 @ 15 m ²)	30 m ² (2 @ 15 m ²)
Meeting Room	15 m ²	15 m ²	15 m ²
Kitchen	15 m ²	15 m ²	15 m ²
Storerooms (10m ² each)	20 m ²	20 m ²	30 m ²
Equipment Store	40 m ²	40 m ²	55 m ²
Circulation for other spaces (does not include Foyer) Including: • Student bags storage and Display areas	50 m ²	50 m ²	50 m ²
Amenities must be added to total: • Student and Staff Toilets • DDA compliant Toilet • Cleaners room	Section 1.7.7	Section 1.7.7	Section 1.7.7
Total for LN	340 m²	340 m²	365 m²

FUNCTIONAL AREA:	Kindergarten (K) Learning Neighbourhood			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	Total m² / LC (see Table 4)	360	480	600

Overview

It is intended that the Kindergarten Learning Neighbourhood will be identical to the equivalent Learning Neighbourhoods for Years 1 to 6. See *section 2.2.2.* for specifications

FUNCTIONAL AREA:	Pre-School Foyer			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	30	30	30

Design Intent

The Pre-School entrance area and adjacent meeting room provide a welcoming zone for parents and set the tone for the atmosphere and identity of the Pre-School. It can serve a number of functions, for example:

- handover of students
- a gallery for exhibitions, information about events, school values and vision and parent notices
- a private room to meet with parents
- a room for visiting specialists to work with children
- a waiting area for parents

Operational factors to consider

At peak times, there will be a considerable number of parents, Pre-Schoolers and siblings moving through the area simultaneously. The circulation space needs to be generous. Parents are required to accompany children into and out of the Pre-School.

Opportunity

An opportunity exists to connect the Meeting Room to the entrance area via a door so that the whole area can serve as a parent gathering zone and resource area. If it is practicable, a close relationship of this area with the kitchen can promote a family/community atmosphere.

Functional requirements

The location, layout and fit out of the Pre-School entry area and Meeting Room is required to:

- be located at the main entrance to the Pre-School and be readily accessible from the Pre School car park
- entrance area to accommodate up to six people (standing, seated and with prams or using mobility aids)
- Meeting Room to accommodate six people
- storage for toys and resources
- be located near the Kitchen

Specific functional requirements

Spatial layout:

- sufficient space around furniture to allow easy movement

Visibility:

- sufficient to see that the meeting room is vacant or occupied
- natural light
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- complete acoustic isolation for privacy in the meeting room

Fitout:

- comfortable chairs in the entrance area and meeting room
- display board
- whiteboard or writeable surface
- sign-in and sign-out bench

ICT: [Refer Technical Specification]

- AV display
- requisite power and data

Security: [Refer Technical Specification]

FUNCTIONAL AREA:	Pre-School Playroom			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	85	85	85

Design Intent

The Pre-School Playrooms provide an area for a variety of learning activities. Self-direction and self-management are encouraged. Learning activities include:

- constructing with blocks and a variety of materials including recycled materials
- reading and storytelling
- creative activities with craft and art materials and equipment
- wet, messy, creative and investigative activities
- imaginative play such as dress up or building cubbyhouses
- role playing
- engaging with jigsaw puzzles, board games, writing and drawing activities that require tables and chairs
- engaging with digital technology devices including tablets, digital microscopes, digital cameras
- watching AV presentations, sing-a-longs, listening to audio presentations and music
- gross motor movement and dance activities
- self-directed choice of toys and activities
- learning to self-manage belongings

Operational factors to consider

The Playroom space is used in multiple ways and must be able to be adapted quickly to support different activities. The adaptability needs to be Agile. Generous open and closed storage is important to support children's self-selection of toys and activities as well as providing readily accessible storage of equipment and materials for staff. The ability for the two playrooms to be opened into one learning space will increase the functionality of the Learning Neighbourhood and should be considered in the design.

Functional requirements

The location, layout and fit out of Playroom space is required to:

- be inviting and intriguing
- give opportunities for children to choose varied spaces and develop gross motor skills through steps
- have seamless access to an adjacent external play space
- include an area to hang and organise coats, hats and bags
- be zoned for different types of activities e.g. wet vs. dry
- be connected to, and have visibility to an adjacent quiet space
- open and closed storage and display for toys, materials and equipment
- provide opportunities for display of children's creations and book displays
- provide connectedness with an adjacent playroom

Specific functional requirement layout:

- sufficient space around furniture to provide play area
- zoned for various activity types e.g. wet vs. dry

Visibility:

- abundant natural light
- line of sight visibility to external play spaces
- line of sight visibility to adjacent playroom(s)

Fitout:

- sufficient chairs to accommodate all children simultaneously
- vinyl flooring in wet zone
- sink with tempered hot and cold water
- whiteboard or writeable surface
- storage cupboard with bench and shelves over
- coat, hat and bag storage
- work bench for wet messy activities – surface to withstand water child strength hammering etc.
- display board(s) at child viewing height

• line of sight visibility to the quiet activities area • children's toilets consistent with the National Quality Framework for early childhood facilities • appropriate treatments for external windows Acoustics: [Refer Technical Specification] • capability to limit sound into and out of the playroom Security: [Refer Technical Specification] • childproof lock(s) on at least one storage area • a way to control egress from the playroom	• whiteboard • clock • window furnishings ICT: [Refer Technical Specification] • AV display with requisite data and power • Phone
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FUNCTIONAL AREA:	Quiet Learning Area			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

The quiet activities area provides a quiet space for a number of functions including:

- respite space for children seeking a quiet, calm space
- a zone for children to sleep
- quiet reading area
- an area to work with children with auditory processing difficulties

Operational factors to consider

Line of sight visibility is required to and from the quiet activities area to the playroom. The room will serve multiple functions – sleep zone, quiet activity zone and at other times as an extension of the main area of the playroom. Location away from high activity zones and capability to prevent sound entering the space need to be considered.

Functional requirements

The location, layout and fit out of the quiet activities area(s) is required to:

- provide a calm peaceful environment
- provide a quiet space
- be able to be used as a seamless extension of the playroom
- provide storage for bedding, soft toys and other resources

Specific functional requirements**Spatial layout:**

- open adaptable space

Visibility:

- sufficient to see that the meeting room is vacant or occupied
- reduced natural light with the capacity to darken
- dimmable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- acoustic separation for adjacent spaces

Fitout:

- a variety of soft furnishings - cushions, small bean bags, small mats to lie on
- display board
- whiteboard or writeable surface
- storage for loose furnishings and other resources
- block-out curtains/blinds

ICT: [Refer Technical Specification]

- wireless coverage
- Security: [Refer Technical Specification]

FUNCTIONAL AREA:	Pre-School Kitchen			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

The Kitchen provides a place where parents and staff can prepare fruit and other refreshments for the children and staff. Parents can meet informally with staff and other parents in the kitchen and can use it as a gathering and conversation space.

Operational factors to consider

Given that it might be used by parents as an informal gathering space, the kitchen needs to be both readily accessible from the entry area while also being readily accessible from the playrooms. It is possible that it will also be used out of school hours.

The Kitchen must be accessible for children with additional needs.

Functional requirements

The location, layout and fit out of the Kitchen is required to:

- provide the basic functionalities of a domestic kitchen
- be accessible to parents and other users without having to enter the main secure zone of the school
- include a bench or equivalent for users to gather around over tea/coffee
- The kitchen is also used as a learning environment for students and a common bench, of appropriate height, between the secure kitchen and student accessible area adjacent should facilitate controlled student participation in food preparation

Specific functional requirements**Spatial layout:**

- sufficient space for up to four adults to be working on food preparation simultaneously

Visibility:

- a degree of visual connectedness with one or more playrooms
- natural light
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- acoustic separation from adjoining spaces

Fitout:

- cooking facilities – hot plates, oven with rangehood
- microwave oven x 2
- dishwasher
- whiteboard or writeable surface
- 2 x medium sized domestic upright refrigerator/freezer
- double bowl stainless steel sink with dual drainers for washing dishes
- hands-free sink or hand basin for hand washing with soap dispenser and paper towel dispenser
- Lockable storage for cooking equipment, crockery and utensils
- childproof lock(s) on doors and drawers below benchtops
- space for waste and recycling bins

ICT: [Refer Technical Specification]

- wireless coverage
- requisite power and data

Security: [Refer Technical Specification]

FUNCTIONAL AREA:	Pre-School Store Rooms			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² (10m ² each)	20	20	30

Design Intent

The Store Room provides an area for the general storage of resources, materials, soft furnishings, equipment and toys.

Operational factors to consider

Some storage needs to be readily accessible from the playrooms while also central for stored items that are shared across the playrooms. Depending on the design layout proposed, there could be the opportunity to provide central combined storage and distribute some storage area to each play room.

Functional requirements

Store rooms are required for the Pre-School Neighbourhood. Each of 10 m² connected to each playroom.

The location, layout and fit out of each Store Room is required to:

- provide adjustable shelving
- floor area for large toys
- containers for loose soft toys, balls, etc.

Specific functional requirements Spatial layout: • all shelving accessible and objects stored visible Visibility: • Natural light not needed • Bright light for effective viewing of stored objects Acoustics: N/A	Fitout: • adjustable shelving ICT: N/A Security: • child proof security
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FUNCTIONAL AREA:	Pre-School Children's Toilets			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² (as per NCC & NQF requirements)			

Design Intent

To provide supervised toilet facilities for Pre-School children.

Operational factors to consider

The toilets need to be able to be readily accessible from inside and outside the building. Discrete viewing of the area is required to provide assistance as needed.

Functional requirements

- Developmentally appropriate toilet height and size and wash facilities
- Nappy change facilities in compliance with Reg. 112 of NCC and the ability of the student to get themselves onto the change area without the need for a staff member to lift the student
- Storage for towels and spare clothing
- Adult hand washing facilities with hot water
- Adequate heating will be required in this area

Specific functional requirements

Spatial layout: NCC & NQF requirements

Visibility:

- discrete visual connectedness to the children's playrooms and external learning environment

Acoustics: [Refer Technical Specification]

- capability to limit sound into and out of the playroom

Security: N/A

Fitout: [Refer Technical Specification]

- developmentally appropriate toilet pans and wash basins
- mirrors at appropriate heights for children
- nappy change facilities with joinery for the student to get onto the facility unaided
- premixed tempered water
- Paper Towel and Soap dispensers
- overhead storage cupboard for spare clothing
- first aid cabinet – lockable
- natural and mechanical ventilation

ICT: N/A

FUNCTIONAL AREA:	Pre-School Accessible Toilet			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² (as per NCC requirements)			

Design Intent

To provide an accessible toilet for children and visitors.

Operational factors to consider

The toilets need to be able to be readily accessible by visitors and staff assisting children.

Functional requirements

DDA compliant.

Size and fitout to conform with NCC requirements.

FUNCTIONAL AREA:	Pre-School External Learning / Play Areas			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² as per NQF requirements	750	1,000	1,000

Design Intent

While the internal environment of a Pre-School Neighbourhood provides multiple opportunities for play, the external area allows children to explore and experience the natural environment. Sand, trees, rocks/boulders, mounds, play equipment, outdoor toys, gardens and access to water play are made possible in the external environment.

Similar to the activities children engage in within the playrooms, in the external environment children enjoy freedom and exercise choice. Activities include:

- growing plants and caring for small animals
- constructing with a variety of materials including natural materials
- creative and imaginative activities
- wet, messy creative and investigative activities
- imaginative play building cubby houses
- activating all of the senses through the incorporation of a variety of tactile elements and sensory garden features
- gross motor movement activities
- explore risks – safe risk-taking
- self-directed choice of activities and environments
- learning to self-manage belongings

In line with the Directorate's policy on inclusion, external play areas must minimise barriers to inclusion.

Operational factors to consider

Children move freely between internal and external spaces. Use of materials that can disrupt the operation of doors and door seals. Pre-School children spend a good portion of their time in the external environment, weather permitting. Shelter from the sun, wind and rain are important considerations.

Opportunity

To enhance transition between Pre-School and Kindergarten linkages between the Learning Neighbourhoods are required between the external and internal learning environments. Locating part of the external learning and play areas for the two Neighbourhoods adjacent to each other is therefore desirable.

Functional requirements

The location, layout and fit out of the external learning environment is required to:

- provide a minimum of 7 m²/child unencumbered space
- use a mix of hard wearing synthetic materials and natural materials
- give opportunities for children to choose varied spaces and activities and develop gross motor skills through steps, safe climbing, running, tumbling, etc.
- be zoned for different types of activities e.g. wet vs. dry
- provide varied opportunities for engagement with natural materials including sensory elements
- provide shelter in the form of shade and wet weather protection
- provide developmentally appropriate play equipment

Specific functional requirements

Spatial layout:

- sufficient space around equipment and structures for running
- zoned for various activity types e.g. wet vs. dry

Visibility:

Fitout:

- developmentally appropriate play equipment and landscape elements
- a sand pit
- water play

• line of sight visibility throughout the external play spaces • line of sight visibility to and from adjacent playroom(s) • discrete visual connectedness to the children's toilets Acoustics: N/A Security: [Refer Technical Specification] • secure perimeter • childproof gates	• work bench for wet messy activities – surface to withstand water child strength hammering etc. • shade and wet weather protection • non – slip paths for ride on toys • Note: a veranda can be included in the calculation of area of either outdoor or indoor space but it can only be counted as either internal or external area. • direct access to equipment storage ICT: N/A
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FUNCTIONAL AREA:	Pre-School Equipment Store			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	40	40	55

Design Intent

The Equipment Store(s) provides an area for the general storage of outside play equipment such as push carts, balls, hoops, sand pit tools, trikes, scooters, chairs, boxes of play equipment and garden tools.

Operational factors to consider

Storage needs to be readily accessible without being intrusive in the external learning environment. Depending on the design layout proposed, it is possible that one equipment store with well zoned areas could satisfy this functional requirement or the area could be distributed across two (or more) smaller storage areas.

Functional requirements

The location, layout and fit out of the Equipment Store(s) is required to provide:

- adjustable shelving
- floor area for large toys
- hanging area for garden tools etc.
- large stainless steel sink to wash toys

Specific functional requirements**Spatial layout:**

- all shelving accessible and objects stored visible
- level entry for trikes, carts etc.

Visibility:

- Natural light not needed
- Bright light for effective viewing of stored objects

Acoustics: N/A

Fitout:

- adjustable shelving
- large sink with cold water, and sand trap on waste
- floor waste

ICT: N/A

Security: [Refer Technical Specification]

- child proof security
- lockable door

2.2.3 Primary School Learning Communities

FUNCTIONAL AREA:	Primary Years 1 to 6 Learning Community (LC)			
Learning Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	Total m² / LC (see Table 6)	927	1,174	1,445

Overview

Each Primary School will have 3 Learning Communities, each with 2 Learning Neighbourhoods to cater for the learning for Years 1 to 6.

Section 2.5 of the EDIS Introduction describes the ACT Education Directorate's position on Learning Space Design best practice and informs the design typology for each LC.

Learning Neighbourhoods range in size to the size of the school. In the ACT this is governed by a number of factors, see *section 1.5, School Size* for details.

Table 6 outlines the Minimum Nett Areas required for the different sized schools.

Functional Units for a Learning Community

- Staff Workspace that each include individual workstations, a collaborative workspace and a kitchenette
- Explicit Teaching spaces with clear views to the collaborative and circulation spaces
- Multipurpose Learning spaces (not necessarily enclosed rooms) shared in the Learning Neighbourhood – see description
- One private meeting room without visibility
- Collaborative spaces for performances, presentations and gatherings – within, and/or shared between Learning Neighbourhoods
- Small Group Program
- Internal Bag storage for student bags
- Storage for resources
- Amenities for students and staff
- Staff Resources/Utilities room
- Integrated external learning settings

Specific requirements for these functional units are listed below in *Table 6*.

Operational factors to consider

The design of the Learning Community support the school to move to the approach of personalise learning. Learning Neighbourhoods allow much greater flexibility in the ways in which can be configured in response to learners' needs and to accommodate fluctuating numbers of students. The key design driver for contemporary learning environments is designing settings and spaces that enhance and support learning. Learning occurs in a number of modes through deliberately designed learning activities and serendipitous situations arising out of interaction between learners and exposure to a range of stimuli. Some Learning Settings have multiple uses while others have more specific purposes.

The specific manner in which individual schools organise and operate teaching and learning groups varies widely across schools. The design must therefore provide the flexibility for the school to choose the organisational structure that will suit their student population and community.

The Learning activities for the 21st century Primary School include:

- Direct, explicit teaching for small (2-6), medium (6-12) and large groups (up to 30)
- Dialogue, community of inquiry, circle groups for medium sized groups (8-15)
- Meetings for discussion, planning and decision-making for small (2-6) and medium (6-12) groups
- Structured and free-form interaction and collaboration in small (2-6) and medium (6-12) groups
- Indoor games
- Hands on, creative activities
- Investigative activities
- Construction, modelling and simulation activities, display of learning resources and student work
- Quiet reflective activities and/or individual research
- Rehearsal larger gatherings, ceremonies and celebrations

Specific functional requirements for the design of a Learning Community

Learning Communities provide a sense of belonging and contribute to building a community of learners.

They include integrated, general and specific purpose learning settings. The combination of Learning Spaces in the LC work in conjunction with additional specialist facilities to enable implementation of all aspects of the Australian Curriculum.

The Learning Community is designed to:

- enable the creation of 'home bases' and provide storage for student bags and belongings; provide extensive space for display and celebration of the creative work and learning achievements of learners
- provide contemporary learning environments (*Section 1.3*), in particular Agile and flexible use
- be activated with loose furniture, equipment and fit out elements to support the functions listed above
- provide clear visibility throughout for supervision and modelling of the learning
- facilitate professional collaboration for designing, planning and teaching
- enable formation of different sized learning groups
- facilitate sharing of resources and learning spaces
- provide storage – fixed and mobile – for teaching and learning resources
- integrate facilities provided to support students with additional needs
- ensure students and staff interact in a comfortable and healthy learning environment
- include ICT capability and equipment as specified for each setting
- be carefully zoned to avoid acoustic interference between different functional areas

An example illustration of these settings are shown in the *Figure 6*.

Integration of facilities for students with additional needs

Another important operational factor to consider in the design of Learning Community buildings is the inclusion of facilities to support learners with additional needs. In all sections of a primary school, facilities to support students with additional needs must be integrated into the Learning Community design. To achieve the design intent, which is to remove 'whatever excludes or marginalises' and remove 'barriers to inclusion' thoughtful design is required. Please refer to *EDIS Introduction section 2.3.2 "Students with Additional Needs"*.

In designing a school that caters for the wide range of additional needs, a dedicated specifically designed area within the Learning Community for a small group of students and staff is required. See *Primary Small Group Program Section 2.2.4*.

3P School Learning Community essential elements:

- Staff Workspace as described in 2.2.5
- Student and staff amenities
- 1 private Meeting Room where visual and acoustic privacy can be provided and suitable for the conduct of confidential conversations
- Store room adjacent to Staff Workspace
- Small Group Program

Each LC requires 2 Learning Neighbourhoods:

Each Neighbourhood requires:

- 1 x large open collaborative space gathering/presentation that can accommodate up to 90 students (students seated on the floor; can be a combination of spaces listed below)
- 3 x spaces for explicit teaching groups as per specific requirements
- 1 wet area space that can accommodate up to 30 students working in small groups and/or individually at a mix of formal and informal settings
- 3 x Multipurpose Learning Spaces – see examples
- integrated display areas
- student bag storage
- access to integrated external learning areas

4P School Learning Community essential elements:

- Staff Workspace as described in 2.2.5
- Student and staff amenities
- 1 private Meeting Room where visual and acoustic privacy can be provided and suitable for the conduct of confidential conversations
- Store room adjacent to Staff Workspace
- Small Group Program

Each LC requires 2 Learning Neighbourhoods:**Each Neighbourhood requires:**

- 1 x large open collaborative space gathering/presentation that can accommodate up to 120 students (students seated on the floor; can be a combination of spaces listed below)
- 4 x spaces for explicit teaching groups as per specific requirements
- 1 wet area space that can accommodate up to 30 students working in small groups and/or individually at a mix of formal and informal settings
- 3 x Multipurpose Learning Spaces – *see examples*
- integrated display areas
- student bag storage
- access to integrated external learning areas

5P School Learning Community essential elements:

- Staff Workspace *as described in 2.2.5*
- Student and staff amenities
- 1 private Meeting Room where visual and acoustic privacy can be provided and suitable for the conduct of confidential conversations
- Store room adjacent to Staff Workspace
- Small Group Program

Each LC requires 2 Learning Neighbourhoods:**Each Neighbourhood requires:**

- 1 x large open collaborative space gathering/presentation that can accommodate up to 150 students (students seated on the floor; can be a combination of spaces listed below)
- 5 x spaces for explicit teaching groups as per specific requirements
- 1 wet area space that can accommodate up to 30 students working in small groups and/or individually at a mix of formal and informal settings
- 3 x Multipurpose Learning Spaces – *see examples*
- integrated display areas
- student bag storage
- access to integrated external learning areas

Specific functional requirements for a Primary School Explicit Teaching Space within the Learning Neighbourhood

- Cater for explicit teaching groups of up to 30 students
- Varying Nett Area sizes with a **min nett area of 75 m² for each Space**
- A “Teaching Wall” for projection and technology, including whiteboards
- Room lighting should be banked to allow the section of the room containing the Teaching wall to be independently controlled
- Glass sliding entry doors to provide clear visibility to Collaborative/circulation spaces
- Acoustic absorptive linings to moderate noise reverberation within the space
- Noticeboard areas for the display of student work, posters and learning aids
- Storage joinery with a minimum internal storage space of 2 m²
- a clock
- Power and Wi-Fi as per *EDIS, Part D – Technical Specifications*
- Lockable doors
- Non-operable external windows
- appropriate treatments for external windows

Multipurpose Learning Spaces Examples

- Medium Learning Space for groups up to 12-15 students
- Small Learning Space for groups up to 6 students
- Reading area
- Maker space

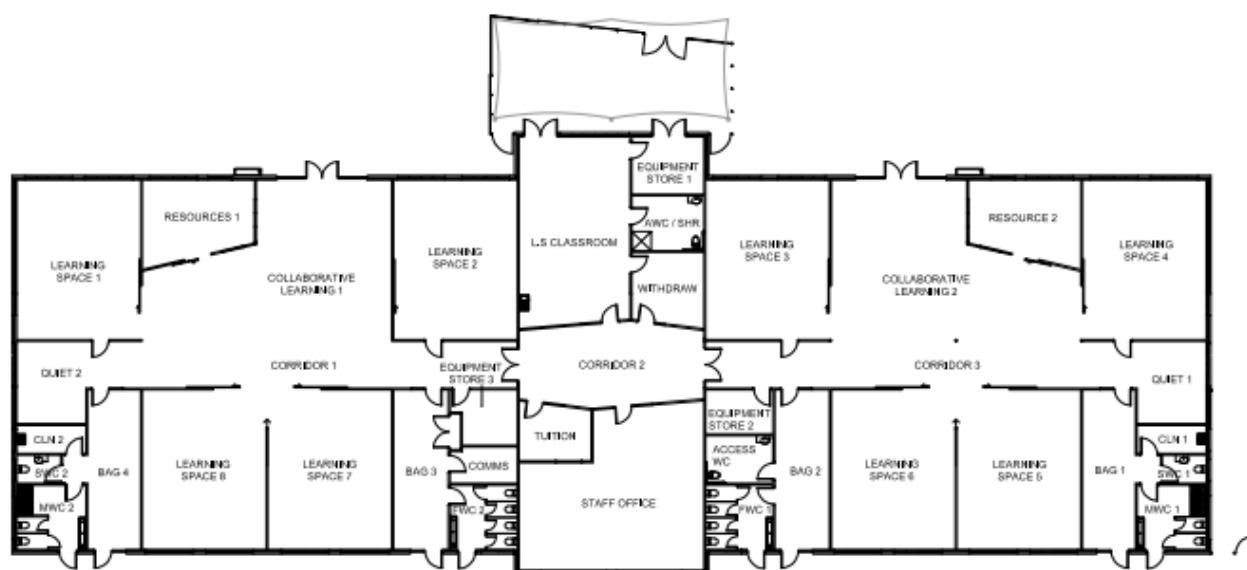
Table 6: Specific functional requirements of a Primary (Yrs. 1 to 6) Learning Community

Functional Unit	Min. Nett Floor Areas for 3P School/LC	Min. Nett Floor Areas for 4P School/LC	Min. Nett Floor Areas for 5P School/LC
Teaching and learning Space Including: - Explicit teaching spaces (Min 75m² each) - Multipurpose Learning Spaces - Collaborative spaces - Wet area space - Circulation for this space	720 m ²	960 m ²	1,200 m ²
Small Group Program	65 m ² (section 2.2.4)	65 m ² (section 2.2.4)	65 m ² (section 2.2.4)
Staff Workspace	60 m ² (section 2.2.5)	70 m ² (section 2.2.5)	80 m ² (section 2.2.5)
Private Meeting Room	15 m ² (section 2.4.1, P.71)	15 m ² (section 2.4.1, P.71)	15 m ² (section 2.4.1, P.71)
Storeroom	15 m ²	15 m ²	25 m ²
Staff Resources/ Utilities Room	12 m ² (section 2.2.6)	12 m ² (section 2.2.6)	12 m ² (section 2.2.6)
Circulation for other spaces Including: Student bags storage and Display areas	40 m ²	52 m ²	60 m ²
Amenities must be added to total: - Student and Staff Toilets - DDA compliant Toilet - Cleaners room	Section 1.7.7	Section 1.7.7	Section 1.7.7
Total for each LC	927 m²	1,174 m²	1,457 m²

Figure 6

Design of a Primary Learning Community for a 4P school

ACT Public School: Charles Weston School



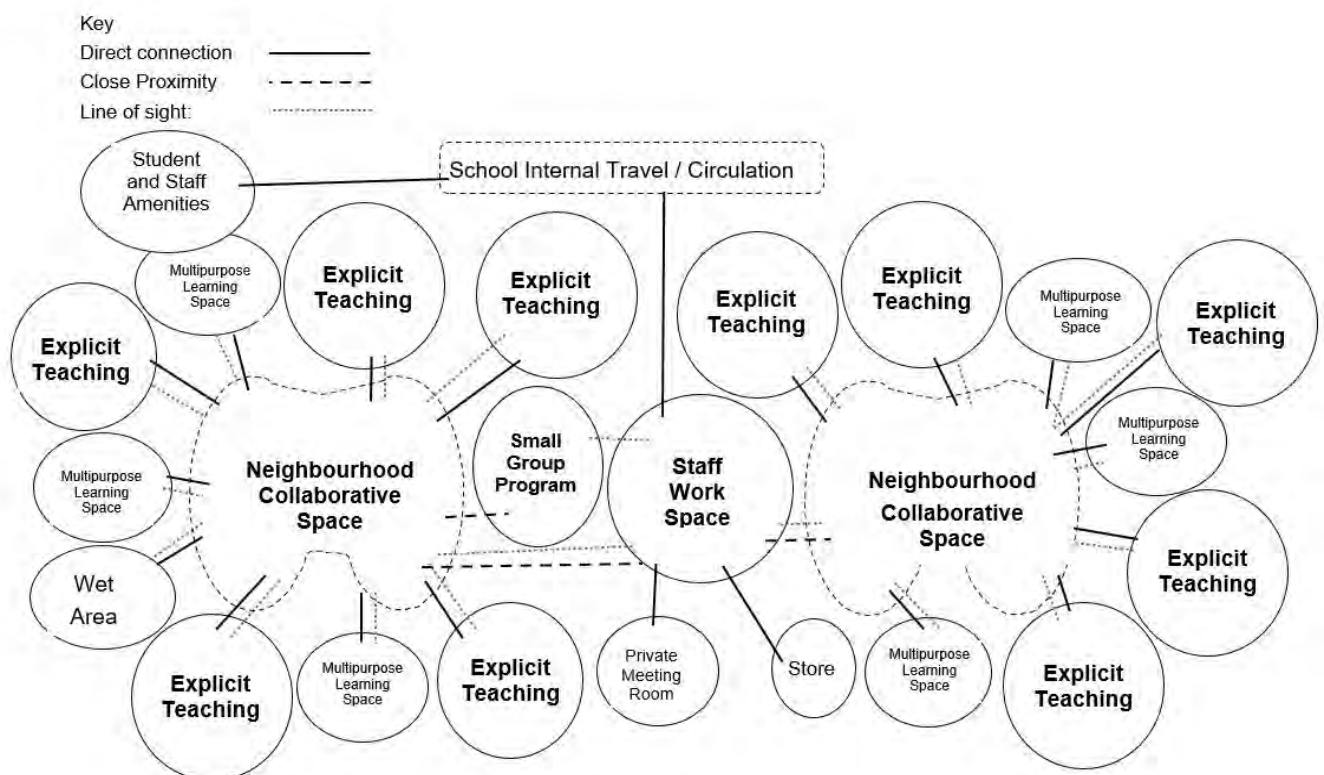


This is an integrated LC for a 4P School students that shows:

- Explicit teaching spaces that can be either opened up or closed down easily by staff to create the different sizes of learning spaces including a large collaborative space
- Uses glass sliding doors to achieve line of sight, acoustic integrity and security requirements
- Central Staff Workspace, with clear sight lines, that has a collaborative space for staff
- Storeroom next to Staff Workspace and further storage in the Staff Workspace
- Agile Meeting Spaces created with furniture, not walls
- A private Meeting Room with walls
- Purposeful use of circulation space
- clear internal travel paths between Neighbourhoods

Figure 7: Functional Relationship Diagram – 5P Yrs. 1-6 LC

Primary Years 1 to 6 Learning Community for a 5P School



2.2.4 Primary School Small Group Program

FUNCTIONAL UNIT:	Primary School Small Group Program			
FUNCTIONAL AREA:	Adjacent to a General Learning Setting			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	260	260	260

Design Intent

Learning support includes the provision of a space where a Small Group Program (SGP) space must provide a quiet, self-contained, adaptable learning environment capable of being utilised for a range of learning modalities.

The SGP must have a component that provides a sensory space. This space maybe considered as either an outdoor courtyard or terrace or a discreet indoor space connected to the internal collaborative space of the SGP. In a Primary School the type of sensory space is determined by the Learning Community to which it is attached. If an Outdoor space is required as a specified element of a specific project, refer to *Appendix 3.3*.

Functional Area

In the ACT individual schools can identify the composition of an SGP. On average, a program will be defined as up to 8 students, staffed with the Full Time Equivalent (FTE) of 1 Teacher and 1 Learning Support Assistant (LSA). **A new Primary School will require 4 SGP Learning Spaces (1/LC) with the specifications below irrespective of school size.** The table below outlines the required areas:

Functional Unit	Area/LC
Learning Space	40m ²
Collaborative Sensory space	15m ²
Store room	10m ²
Circulation is included	
Total	65m²

The Small Group Program requires access to a unisex DDA compliant student toilet/shower room.

Operational factors to consider

Students accessing the SGP may have a range of disabilities affecting mobility, motor skills, hearing, sight, concentration and communication. Some students may use mobility aids, as such door openings must provide width suitable for wheelchair users. Some students may demonstrate behaviours involving noise, risk taking, fixations or wandering. **The SGP space must reduce external sources of stimulation and distraction, including eliminating noise intrusion through bounding walls and limiting view lines to and from adjoining learning and circulation spaces.**

Staff must have clear lines of sight to all extents within the SGP space (no hidden corners).

Functional requirements

The space must include:

- A fitted hearing augmentation system
- A "Teaching Wall" for projection and technology (including whiteboards) in each of the Learning Spaces
- The provision (in joinery and in walk-in store rooms) of fitted storage spaces for teaching resources, reference materials, student aids, etc. accessible directly from within the SGP
- Acoustic absorptive linings to moderate noise reverberation within the SGP
- Noticeboard areas for the display of student work, posters and learning aids
- The use of durable materials to minimise damage associated with the use of mobility aids
- appropriate treatments for external windows
- a clock
- immediate access to DDA compliant student toilet facilities

The bounding walls of the SGP must minimise the intrusion of external sources of stimulation and distraction. The walls, windows and doors must be able to acoustically isolate the SGP from adjoining Learning Setting.

Staff must have line of sight throughout the SGP. All glazing must meet sound insulation requirements.

Provision must be made for an adjunct area adjacent to the main SGP Learning Space(s), referred to as a **Collaborative Sensory space**. Functions including:

- individual or small group quiet and reflective work
- a space that students can use to find a calming environment and reduce stimulation so that they can re-focus and recover and then return to school activities

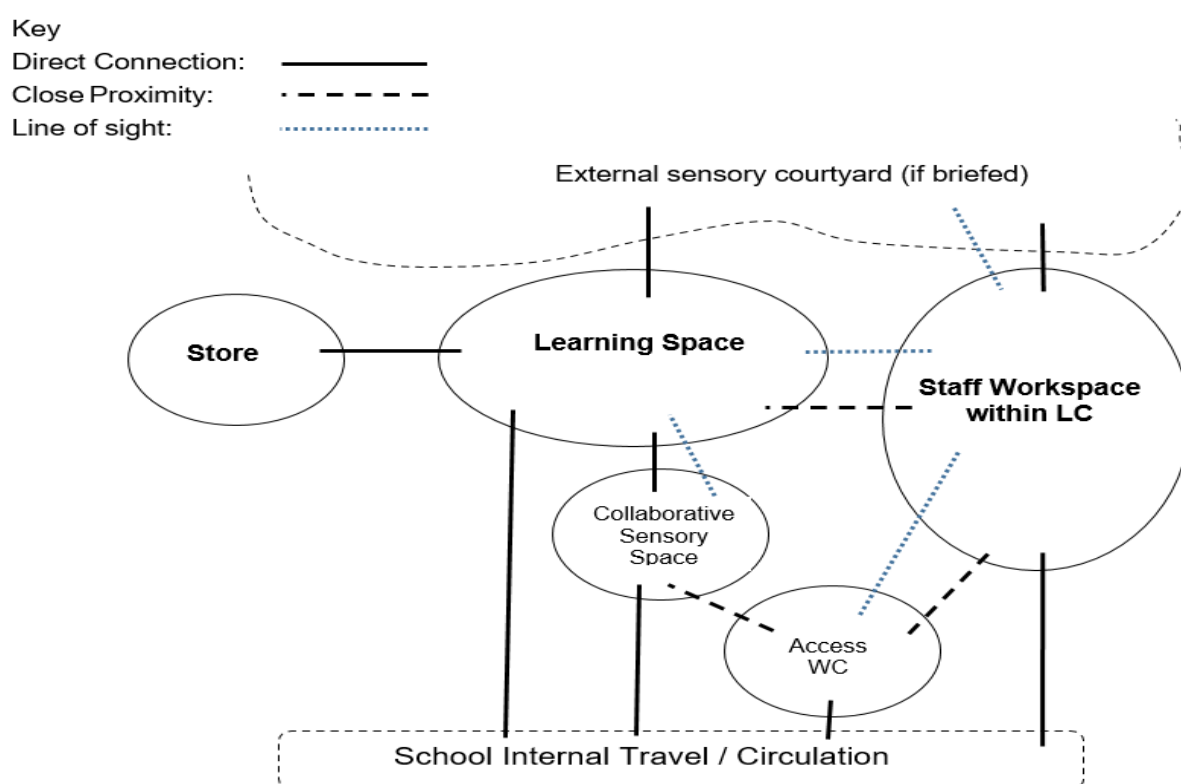
The space should be designed as an alcove without a door that could be used for a student to exit from engagement with their peers and/or environment in the SGP. The space must have sound absorbing linings and adjustable controls over natural and artificial illumination levels.

The SGP must have **access to a DDA compliant student toilet** that includes:

- hands-free basin
- assisted shower, sized to permit the use of mobile lifting aids (hoists) and to allow space for up to two adults to assist a student using the amenities.
- space for an electric height adjustable adult sized change table (dimensions approx.: 750x1800mm)
- storage of a commode and mobile hoist
- appropriate circulation for turning circles for a powered wheelchair
- structural provisions that would later permit the installation of overhead tracking and powered lifting hoists that cover the full area of the toilet/shower room and extending from the adjacent SGP space. The design must identify the location where a future tracking hoist would be parked when not in use.
- conveniently accessible joinery units containing 4 lockers or pigeon holes to store the personal requisites for individual students who have problems with continence (including fresh clothes, nappies and continence pads).

The **SGP Store Room** requirements in both the to include drawers (with dividers), cupboards and open adjustable shelves.

Figure 8: Functional Relationship Diagram – SGP



2.2.5 Staff Workspace

FUNCTIONAL UNIT:	Staff Workspace			
FUNCTIONAL AREA:	Learning Communities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² (per LC)	60	70	80

Design Intent

Staff Workspaces provide spaces where several staff, including SLCs (School Leader C) will work individually and collaboratively to meet, engage in dialogue and discussion, design and plan, analyse student data together, access resources, write reports, store resources and secure personal belongings.

One Staff Workspace is required per Learning Community.

It is essential that the Staff Workspace is highly visible to the Learning areas to model both individual and collaborative work to students and to enable passive supervision.

Operational factors to consider

While providing a separate space from the Learning Setting areas, the Staff Workspace needs to be readily accessed and have visibility to and from the Learning Setting for access to resources and for line of sight supervision. The location of any permanent joinery must enable the school to arrange furniture according to its operation. The number of staff that need to be accommodated in a Workspace will vary with the school enrolment, the size of the teaching team, and the size of the Learning Setting. These metrics must be considered, and the number of Staff Workspaces confirmed, early in the design process. As a guide, under the current Enterprise Agreements (EA):

- For a 3P school a maximum of 10 staff/Staff Workspace
- For a 4P school a maximum of 14 staff/Staff Workspace
- For a 5P school a maximum of 18 staff/Staff Workspace

Functional requirements

The location, layout and fit out of the Staff Workspace is required to provide:

- Individual work stations for each staff member
- Lockable Storage for resources—files, books, folders, other teaching resources
- Secure storage for individual belongings
- A setting to support collaborative work for the full complement of staff
- Display area for resources
- A Kitchenette

Specific functional requirements**Spatial layout:**

- zones for individual and collaborative work
- sufficient space to provide ease of movement between work stations, storage and the collaboration zone

Visibility:

- line of sight to and from the Learning area
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- complete acoustic separation from adjacent spaces to ensure privacy

Security: [Refer Technical Specification]**ICT:** [Refer Technical Specification]**Fitout**

- meeting table and chairs
- individual, Height adjustable teacher work stations/desks with secure storage section. Workstation size and spacing should assume each teacher has dual monitors and use a laptop computer
- individual storage shelves and under desk filing cabinet
- Lockable storage for teacher resources
- display area
- large whiteboard
- AV capability
- Kitchenette fitout – Joinery, sink, zip hot water, fridge, dishwasher, microwave, waste & recycling bins
- Clock

2.2.6 Staff Resource and Utilities Room

FUNCTIONAL UNIT:	Staff Resource and Utilities Room(s)			
FUNCTIONAL AREA:	Learning Communities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	12	12	12

Design Intent

The Staff Resource and Utilities area is used by staff to print materials, prepare learning resources including laminating posters, documents and teaching aids that is readily accessible for staff in the Learning areas. It is also used for some storage of stationery and printer/photocopier consumables.

The Staff Resource and Utilities area acts as a central location in the Learning Community for paper recycling.

Operational factors to consider

At peak times there can be high demand for work space. Careful distribution of functions and layout is required to facilitate efficient and effective use of the space. Bench depth and length needs to be considered to ensure adequate space for equipment and for production areas.

Consideration needs to be given to machinery and production sound intruding into surrounding spaces.

Functional requirements

The location, layout and fit out of the Resource and Utilities Area is required to:

- **be located so that it is readily accessible to each of the Learning Communities.** This may mean, depending on design that this Functional Area can be shared between Learning Communities. For example: 1 shared for the P/K LC and 1 of the 1-6 LCs; and 1 shared for the other 2 LCs (this configuration would be 2 rooms at 12m² each)
- provide efficient use of space for unobstructed circulation and access to photocopiers (MFD), storage, networked printers, binders, laminating machines, work benches, recycling (this should facilitate cardboard, paper, ink cartridges and general waste at a minimum)

Specific functional requirements**Spatial layout:**

- Layout and room shape designed to facilitate several people involved in printing and production activity, accessing storage

Visibility:

- Bright light to all work areas
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- Containment (within the space) of sound of appliances and equipment

ICT: [Refer Technical Specification]

- power and ICT connectivity for appliances and networked devices

Security:

- Lockable door

Fitout:

- multifunctional printer, copier and scanner
- space for recycling receptacles including a paper wheelie bin
- storage for a range of supplies
- an extended, deep horizontal work space suitable for the production, layout, cutting, laminating and binding of printed materials
- a work surface with open space below
- open storage area for frequently used supplies—paper, cardboard

2.2.7 Student Sanitary Amenities

FUNCTIONAL UNIT:	Student Sanitary Amenities
FUNCTIONAL AREA:	Learning Communities and Specialist Learning Settings

- Base the student sanitary amenity requirement on the minimum requirements of the NCC based on an even split of male and female students on the Peak Enrolment number.
- The number of sanitary amenities provided may exceed the NCC requirements in order to satisfy all the requirements under this Functional Brief.
- Refer to other sections of this brief that refer to specific locations and requirements for sanitary amenities for students including:
 - Hall/Gymnasium
 - Small Group Program
- Toilets must be distributed throughout the permanent and modular facilities
- The toilet amenities must be equitably distributed to meet the needs of the entire school community, and their placement must consider availability to users when isolated portions of buildings are available for community use out of school hours
- Co-locate at each bank of toilets one toilet for non-gender specific persons
- Accessible toilets are also to be co-located
- Student toilets are to be a mix of single gender and unisex toilets. The single gender and unisex toilets are to be co-located, rather than segregated and must have the flexibility to be used as single gender or unisex (non-gender specific) over time
- Sanitary Amenities should be accessible from inside the school during class time and outside the school during class breaks

2.3 Primary School Specialist Learning Facilities

FUNCTIONAL AREA:

Primary Specialist Learning Settings (SLS)

Overview

Specialist Facilities are required for the delivery of key elements of the National Curriculum. These facilities are frequently designed for the delivery of one specific area of study or several similar areas of study. Specialist Facilities can be distinguished from general learning settings by the need for specialist equipment or fitout to allow the study subject to be delivered, or by the configuration of space for special activities.

The curriculum elements that require Specialist Facilities can be briefly summarised as Science, Arts, Food Technology and Physical Education.

Functional Units for Primary School Specialist Facilities

- 2 Adaptable STEAM Learning Spaces to support learning in Science, Technology, Engineering, Art and Mathematics
- Functional space to support learning in **Food Technology**
- **1 Adaptable Specialty Space (5P only)**
- **Music** (with instrument storage) see Multi-Purpose Hall
- Functional spaces to support learning in the area of **Health, Physical and Outdoor Education**

Operational Factors to Consider

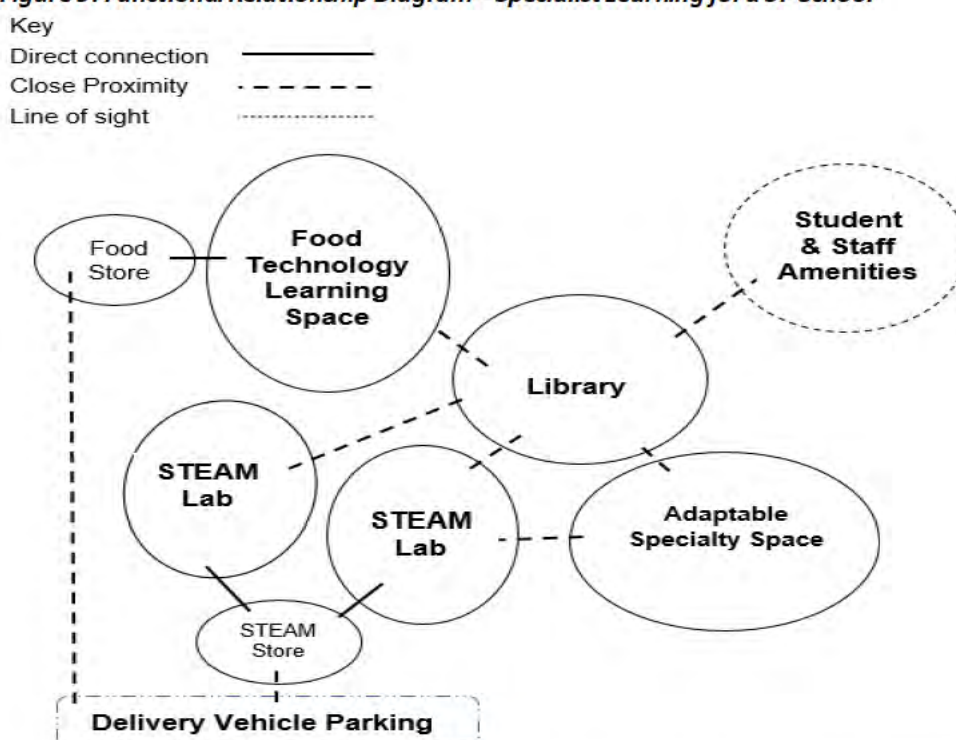
In Primary Schools, Specialist Functional Areas and Functional Units are accessed by all students in the school. The design must promote this access while minimising the disruption to the general Learning areas. As such connected to other learning areas used by all students, such as the Library or as stand-alone areas is preferable.

Some Specialist Facilities are best grouped together to facilitate and encourage interdisciplinary learning. The utilisation of other Specialist Facilities is best done if they are co-located with similar whole-school-use facilities. Examples of this case would be:

- the co-location of the Food Technology area with the School Canteen and with proximity to large group meeting spaces where catered functions may be held
- the co-location of the Music Learning Space with the Hall to support the performances and school events

Management of noise and acoustic engineering can be an important operational factor for Specialist Facilities. Some activities in Music and Physical Education spaces can generate high levels of noise in normal use, and acoustic isolation is required to contain and control noise within the spaces, and to prevent noise leakage out to other spaces. Music spaces can be sensitive to leakage of noise from outside the space, and acoustic isolation is needed to prevent the intrusion of distracting external noise.

Figure 9: Functional Relationship Diagram – Specialist Learning for a 5P School



2.3.1 Specialist Facilities – STEAM Laboratory

FUNCTIONAL UNIT:	STEAM Laboratory			
FUNCTIONAL AREA:	Specialist Facilities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	2 @ 90	2 @ 90	2 @ 90

Design Intent

These facilities are to support practical learning for the areas of Science, Technology, Engineering, Art and mathematics (STEAM). These support the compulsory delivery of the relevant sections of the Year K – Year 6 Australian Curriculum to all Primary School Students.

Science facilities for practical study must incorporate Universal Design Principles so that functions and equipment are accessible to any user – some sections of serviced bench (including a laboratory sink) must be vertically adjustable, with clear space below.

Function

The use of the spaces will require an Agile configuration to allow staff to use the space for a variety of uses incorporated within the broad area of STEAM. E.g. the space must be able to be easily reconfigured to allow the school to use it has a Science Lab and an Art studio.

Functional areas that support STEAM investigations including sustainability and environmental projects, could be integrated with a productive garden and other garden or environmental education features to provide a learning space accessible for use by all students P–6.

Opportunities

In the planning of the location for this facility, co-location in a building that contains other specialist provision should be considered.

Operational factors to consider

The study of Science at the primary level does not involve the use of many hazardous or corrosive chemicals. However, the design must incorporate the safe storage and use of laboratory chemicals and must consider the safety of users and deliver facilities that are resilient to the damage from raw chemical products. The school will have a duty of care in relation to the health and safety of all students and staff. The facilities must be designed to support the school in meeting its obligations under the Work Health and Safety Act 2011 in addition to relevant Territory health and safety legislation or guidelines.

Students will wear protective clothing and equipment, and suitable storage must be provided for class sets of laboratory coats, eye protection, gloves, etc.

For safety considerations, the spaces must be able to be secured with lockable doors that prevent students accessing the space unless permitted by a supervising member of staff.

Functional requirements:

- “Teaching Wall” for projection and technology (including whiteboards)
- Placement of whiteboards and AV screens must consider view lines of the students
- 2 wet areas, including sinks and high neck laboratory taps accessible located on one of the side walls
- 1 large Arts Grade trough with H/C high taps serviced by a clay trap
- Flexible workstations including movable extension benches enabling teachers to develop a variety of student working groups from individual to large groups and to support a range of practical and experimental activities
- bench near the front of the lab fitted with power and sink with H/C taps
- distributed power outlets, with provision reconciled against estimated requirements for electrical appliances
- bench space (in addition to student workstations) for setting up experiments that will remain for long time periods, and to accommodate shared use equipment

- storage cupboards and drawers – both lockable and open access
- cabinets for display
- extensive display area for visual learning aids, posters, graphics, etc.

Specific functional requirements

Spatial layout:

- access from building interior
- layout of space designed to permit line of sight supervision of all students by a single teacher

Visibility:

- clear views into the Learning Space from Circulation Space
- bright light to all areas
- appropriate treatments for external windows

Security:

- lockable doors
- lockable internal storage

ICT:

- AV display
- Wi-Fi points

Fitout and equipment:

- Display areas – extensive notice boards and whiteboards
- chemical resistant benchwork and joinery, both fitted and mobile configured as workstations for students in pairs, small groups or for individuals
- 3 Arts grade inset bowl sinks, with high neck tapware (Cold water supply only)
- hand wash facilities (basin, soap dispenser, paper towel dispenser)
- chemical grade fire extinguisher
- lockable storage (as cupboards and drawers for the storage of equipment and glassware)
- clock
- seating suited to benchtop height workstations

STEAM Store

FUNCTIONAL UNIT:	STEAM Store			
FUNCTIONAL AREA:	Specialist Facilities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

A functional area is for storage of the school's STEAM resources.

Function

The space will contain an inventory of resources, consumables and some chemicals

Operational factors to consider

All surfaces must be resistant to damage and staining that may be caused by the accidental spillage or the long term use of STEAM consumables.

The spaces must be able to be secured with lockable doors that prevent students accessing the space.

Functional requirements:

- fitted joinery comprising secure storage with and without adjustable shelving

Specific functional requirements**Spatial layout:**

- access from the adjoining STEAM Labs

Visibility:

- bright light to all areas

Security:

- lockable doors
- lockable internal storage

Fitout and equipment:

- fitted joinery
- chemical grade fire extinguishers
- lockable storage (as cupboards)
- Safety signage as required by law, codes and standards

2.3.2 Design and Technology – Food Technology

FUNCTIONAL UNIT:	Food Technology – includes pantry			
FUNCTIONAL AREA:	Specialist Facilities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	100	100	100

Design Intent

The study of Food Technology for the K-6 curriculum will involve learning core concepts about the science of food, food in cultures, and food and health; how raw materials are modified in the cooking process, technical skills, opportunities for creative design decisions, skills in collaborative work and the vocational aspects of Food Technology.

Students will study the foundation principles in the preparation and cooking of food, including:

- the relationship between healthy food choices and personal health and well-being
- the development of safe food handling and practical food preparation skills
- safe cooking methods

Opportunity

In serving as the learning space for Food Technology programs, this space presents many opportunities for authentic learning projects such as a café run by and for students or catering for events and performances.

Operational factors to consider

The co-location or proximate adjacency of the Functional Area for Food Technology and the School Canteen is supported by the similarity of the functional and technical requirements of these spaces. Both spaces require delivery of food materials and the removal of food waste, and both spaces require exhaust ventilation, and frequent cleaning to high standards.

Functional requirements

- Practical Learning Space, for students engaged in individual or small group food preparation and cooking project work, fitted with 2 kitchen settings fitted with sinks, benchtop work areas, domestic standard kitchen equipment (cooktops, ovens, microwave ovens), with exhaust ventilation over cooktops, and storage below benchtops for utensils needed to prepare, measure, combine, cook and serve food.
- The Learning Spaces must incorporate Universal Design Principles, so that functions and equipment are accessible to any user – some sections of serviced bench (including a kitchen sink) must be vertically adjustable, with clear open space below, and this work point must also have fully accessible fitments, storage and cooking appliances
- Each Learning Space must incorporate:
 - a “Teaching Wall” for projection and technology including whiteboards (with clear view lines from all cooking locations)
 - a practical demonstration bench fitted with a sink, cooktop and oven for teacher presentation
- Wall space suitable for the adaptive display of visual guides, charts and posters
- Provision for safe food handling practice and hygiene, including an auto sensor hand wash basin (with soap dispenser and paper towel dispenser) in each Learning space
- **Pantry/ store room (10 m²)** with stainless steel racking and shelving for packaged foods stored in bulk and for in-use dry-goods stored in sealed containers and storage space for two stainless steel trolleys
- Storage cupboards for consumables (such as rubber gloves, hairnets, paper towels, sponges) and for storage of multiple class sets of aprons, towels, etc.
- Resource recovery receptacles for mixed recyclables and organic waste

Specific functional requirements

Spatial layout:

- service spaces (pantry 10m²) located adjacent to Learning
- sufficient space for students to work and circulate safely while working with hot food and cooking appliances
- unobstructed area to receive deliveries and for removal of waste
- space for waste receptacles, bins, etc.

Visibility:

- clear views into the Learning Space from Circulation Space
- line of sight teacher supervision across practical teaching spaces
- daylight and electrical luminaires for safe working lighting levels
- appropriate treatments for external windows

Acoustics: (refer Technical Specification)

- Management of noise levels for students to hear and understand spoken instructions across the Learning spaces
- noise from operating laundry equipment must be contained to the scullery space

Hydraulics

- H & C potable water
- stainless steel kitchen sinks with drainers, laundry trough
- floor wastes
- hands free hand wash basin

Electrical

- adequate power outlets to support fixed and portable equipment and appliances, and fixed services, AV, etc.
- power outlets distributed around walls and above and below benchtops

Fitout

- all materials selections and detailing to be resilient to abrasion, to repeated wet cleaning, and to moisture and food spills
- easily cleaned wall and ceiling surfaces suited to areas where food is prepared
- resilient flooring, integral self-coved skirting
- fitted joinery with splashbacks, and storage under benchtops in a variety of draw and cupboard configurations at each work point
- storage for aprons, consumables, cleaners, cleaning gear (including brooms, mops and buckets)
- clock
- whiteboards and display boards (sufficient to display, posters, charts, etc.)
- fire extinguishers and fire blankets
- waste bins, sized for the volume of waste generated daily, and multiple bins to suit sorting of waste into recycling categories including compostable waste
- appliances including refrigerators, freezers, dishwashers, microwave ovens, a clothes washing machine and dryer
- ovens, cooktops and exhaust hoods distributed at kitchen work points
- soap and hand sanitiser dispensers
- paper towel dispensers
- adjustable stainless steel racking and shelving along walls in pantry

Security (Refer Technical Specification)

- All entry doors lockable. The space must be secured when not supervised by staff

ICT

- AV projection in Learning Space

2.3.3 Adaptable Speciality Space

FUNCTIONAL UNIT:	Adaptable Specialty Space	
FUNCTIONAL AREA:	Specialist Facilities	
Min Nett Area:	Permanent buildings provided for a Primary School size of:	5P only
	m ²	100

Design Intent

There is an extensive range of curriculum and co-curricular activities offered across the Primary School. In addition to the specific Specialist Facilities described in the previous pages, a 5P Primary School needs an Agile adaptable serviced space that can be configured and utilised (in the short or long term) to meet the requirements of students and the school when an additional or emerging subject area needs to be delivered.

Without limitation, the following are examples of possible uses:

- Languages
- Band room
- Practice and rehearsal activities for Music, Drama and other performing arts including rehearsals of the school choir
- Project space for interdisciplinary projects e.g. school production
- Gallery/ exhibition space

Functional requirements

The Adaptable Performing Arts Space must be designed to be Agile and Flexible in its use through mobile equipment, the proportions of its floor plan, the provision of suitable storage space, and clear visibility and ease of movement. It should be designed in such a way as to maximize the available space and therefore student usage.

Some possible uses will be noisy (the School Band for example). The Adaptable Space must be delivered as a fully enclosed room, with the installed walls and doors must function as an acoustic boundary, and the design must permit the school to simply complete the enclosure of the space with glazed walls and doors.

The space must also have the capability of be divided into two spaces if required by the school.

The Adaptable Space would benefit from having direct line of sight to the other Learning Spaces in the Centre.

As a default, the Adaptable Space will be finished with the same specific requirements as a Learning Community Explicit Teaching Space and the flooring selection as used in the Music Learning Space.

2.3.4 Specialist Facilities – Multipurpose Hall/Gymnasium

FUNCTIONAL AREA:	Multi-Purpose Hall/Gymnasium			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	1,225	1,235	1,245

Design Intent

The function of this area is to support learning in the areas of Health and Physical Education (HPE) and production and performance for the Performing Arts.

Operational factors to consider

The Hall will be used by the school for assemblies, performances and other large scale events and therefore must have the capacity to seat the whole school cohort and guests.

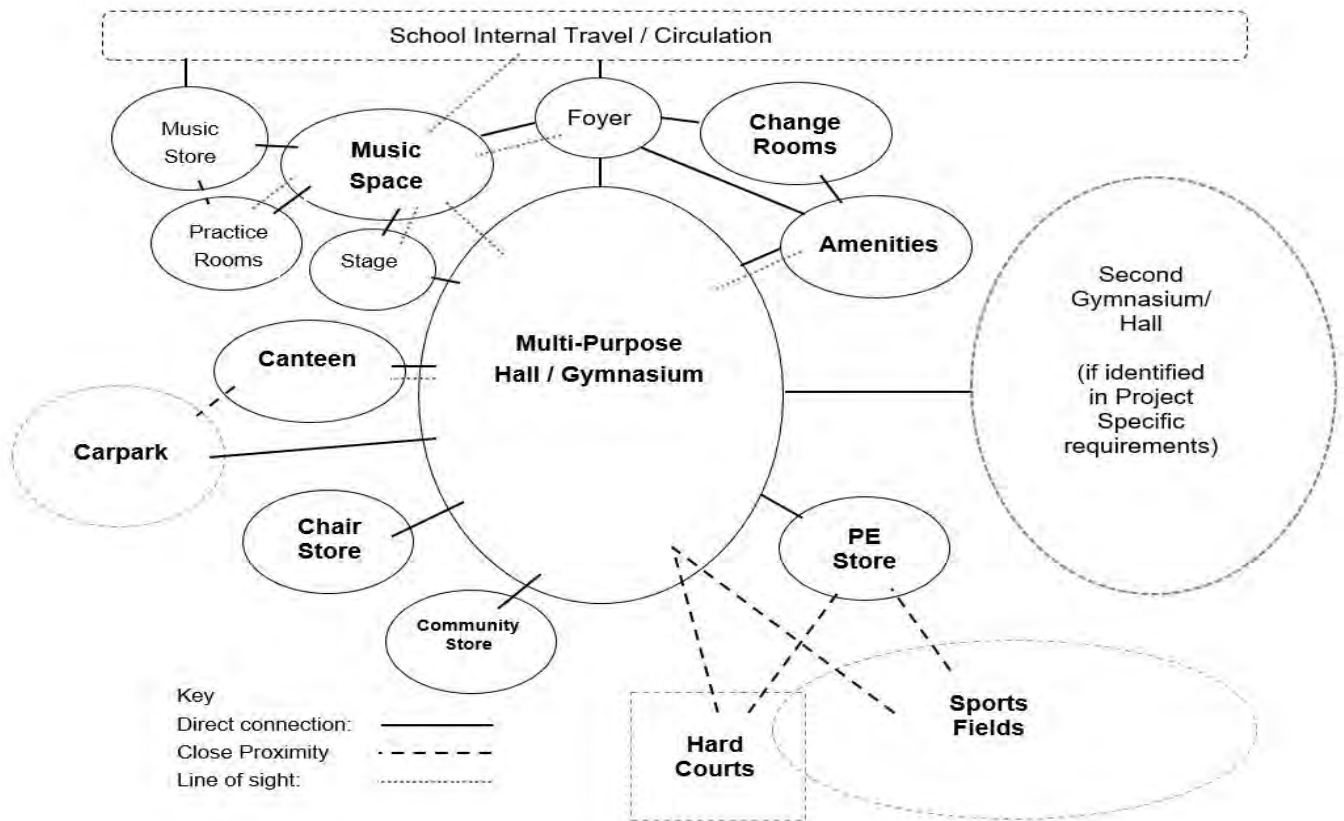
Functional Units:

The design of Multi-Purpose Hall must contain:

• Gymnasium	825 m ²	825 m ²	825 m ²
• Foyer	from Circ	from Circ	from Circ
• Stage	55 m ²	55 m ²	55 m ²
• Chair Store	50 m ²	60 m ²	70 m ²
• Music Learning Space	80 m ²	80 m ²	80 m ²
• 2 Practice rooms (10m ² each)	20 m ²	20 m ²	20 m ²
• Music Store	20 m ²	20 m ²	20 m ²
• PE Store	50 m ²	50 m ²	50 m ²
• Community Store	10 m ²	10 m ²	10 m ²
• Change Rooms (2)	60 m ²	60 m ²	60 m ²
• Staff and Student Amenities	Section 1.7.7	Section 1.7.7	Section 1.7.7
• Circulation (does not Gym floor space)	55 m ²	55 m ²	55 m ²

Refer to subsequent room sheets for specific functional requirements

Figure 10: Functional Relationship Diagram – Multi-Purpose Hall



Multi-purpose Hall – Hall/Gym

FUNCTIONAL UNIT:	Gymnasium			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	825	825	825

Design Intent

The Hall will also be used by the school for assemblies, performances and other large scale events and therefore must have the capacity to seat the whole school cohort and guests. This capacity is suggested as:

- For a 3P School a capacity of 1,000 adults seated (all students, staff and guests for 60% of LTE)
- For a 4P School a capacity of 1,300 adults seated (all students, staff and guests for 60% of LTE)
- For a 5P School a capacity of 1,600 adults seated (all students, staff and guests for 60% of LTE)

Functional Areas required to support effective physical education must provide for participation in physical activity and the development of motor skills and movement competence, health-related physical fitness and sport education. This Functional Area must support students engaging in physical activity, games, sport and outdoor recreation. The Gymnasium, outdoor hard courts and open sports field provide Functional Units for a range of formalised games and sports.

Operational factors to consider

The design of the Gym must prioritise its primary function i.e. the school's indoor Learning Space for Health and Physical Education.

Many activities that normally take place in the Gym will generate high levels of noise, with these activities occurring during and outside normal school hours. The construction of the enclosure around the Gym, the internal lining materials and penetrations such as doors, windows and vents must contain and absorb noise generated by activities in this space, so that leakage of noise does not impact on the use of adjoining school Functional Areas and does not cause nuisance to residential neighbours.

Zoning of the Gym and associated functional units for use out of school hours by the school or by Community users. Zoning for use out of hours must consider access to toilet and change amenities, and safe access and egress including emergency egress for users.

Opportunities

The design should consider opportunities for shared use of the specialist facilities with the Community and opportunities for integration with other functional areas. A multi-purpose space that connects the Gym and Hall entry lobby would mean that a single functionality in this zone could serve several functions including catering to audiences of performances or events.

Functional requirements

- Large indoor sports Gym sufficient to accommodate and line marked for: 1 (Single Gym) competition netball court, overlaid with line marking in different colours for full size competition basketball, volleyball, multiple badminton and futsal courts, and bounded by competition standard obstacle free run-off spaces
- Competition standard sports floor, providing shock absorption with energy return and ball bounce characteristics and traction for players wearing indoor sports shoes
- an electronic scoreboard located on long wall on opposite side to netball coach zone with backbone cabling (power and data) connecting back to a scorers position on the opposite side of the court
- Suitable for use as a seated audience area for school assemblies or by Community user groups
- Student entry area connected to change rooms
- Provision of wall space and recessed glass fronted display cabinets in the student entry area for the display of sports team trophies, pennants, team photos, and notices
- Close proximity to the External Learning Spaces

Specific functional requirements

- critical plan dimensions and height for sports activities
- minimum floor to ceiling height of 7.0m throughout the room

Fitout

- robust walls to 2.1m height
- operable basketball baskets and backboards (at each end of each court), that can be simply moved

- even distribution of diffused natural light, and natural or forced air ventilation to comply with NCC requirements for an audience venue
- a perimeter runoff space to all sides of the Netball court compliant with regulations

Visibility

- visibility of internal activity from adjacent internal corridors
- avoid direct sunlight onto the court area
- avoid external windows that create localised high glare behind goals and backboards

Acoustics

- control of noise leakage from this space
- control of reverberation from noise generated by activities in this space
- noting the multi-function requirement for this space, the design must manage building acoustics and moderate reverberation

Hydraulics

- Proximity to student and staff toilets and change rooms
- Cold water bottle refilling station in the student entry area to the Gym

Security

- Locking to all doors and roller shutters
- Capacity to isolate the Gym and dependant functions as a contained zone for out of hours use

away (motor drive) when the sports court area is used for other functions

- inset capped proprietary floor sockets (per court) for goal posts for other sports
- permanent court line marking (per court) in different colours to delineate the multiple overlapping sports court layouts
- loose accessories and fitments must be provided to configure the courts for the identified sports including goals, nets, posts, with post sockets (fitted with screw in caps) incorporated into the floor
- all fitments installed in the Gym (including light fittings, emergency exit lights, loudspeakers, security sensors, wireless antennae, light switches, power points, etc) must be robust and protected from impact damage
- there must be no ledges or narrow points where sports balls can be trapped
- a suspended and motor driven dividing net and curtain must be provided to separate the two sports courts (with the net location aligned with the boundary line between adjacent run-off zones for each court area). Note: - Double gym only
- Adequate heating and cooling

ICT

- Wi-Fi wireless coverage
- Audio visual and projection system for use in presentations to large audiences, enabling zoning between large and small areas and cabled to multiple connection points where microphones and music systems can be connected
- integrated AV/PA system with speakers and capability to broadcast music from USB source
- All AV equipment must include protection from ball strike

Multi-Purpose Hall - Stage

FUNCTIONAL UNIT:	Stage			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	55	55	55

Design Intent

The Stage area is an adjunct area of the Hall connected by a proscenium opening (of approximately 5.0 – 6.0m width) in a wall of the Hall. To deliver clear audience view lines, the stage floor level will be elevated above the floor level of the Hall. The elevated stage floor will not project into the Hall. All stage area will be behind the proscenium opening. If an event requires a stage projecting into the Hall, this will be created as a temporary installation using modular staging.

The Stage opening must be controllable by an operable curtain.

Operational factors to consider

The stage must be accessible to all users. The design must allow members of the audience in the Hall to directly and conveniently negotiate the change of floor levels and access the stage.

The preferred stage location is centrally on a narrower wall of the Hall, to provide best audience view lines from every position in the Hall.

To support a wide range of music and performing arts uses, the Stage must have convenient proximity to store rooms, amenities and rooms that can serve (on a gendered basis) as make-up and costume dressing rooms for performers.

To support a range of school activities and the possible needs of community users, the Stage should have adjacency to a road or carpark area where delivery trucks can deliver and collect equipment.

Functional requirements

- Level (un-raked) proscenium stage
- Stage curtains and wings each side, and short curtains above the stage to conceal overhead lighting
- Three overhead fixed lighting bars – each with 12 dimmable outlets and 2x 3phase outlets
- Proximity to music store and to spaces that can serve as dressing rooms
- Audio/lighting/ visual systems with a connection points at both the front and back of the Hall
- The Stage and Hall must be served by an audio loop/ hearing augmentation system

Specific functional requirements**Spatial layout:****Visibility:**

- Clear sightlines from all seats to stage and projection screen

Acoustics: (refer Technical Specification)

- High levels of acoustic containment up to and including containment of amplified musical instruments and kit drums, and to isolate the Stage from noise generated in the adjacent Hall

Fitout:

- Lectern with mike and computer ledge
- Stage curtains

Security (Refer Technical Specification)**ICT and AV**

- PA Mixer/amplifier
- Projection – sized to suit auditorium audience view lines
- Front of House speakers (including horns and sub-woofers)
- Speakers
- Infrastructure for wireless hand held microphones
- The Stage and Hall must be served by an audio loop/ hearing augmentation system

Multi-Purpose Hall – Chair Store

FUNCTIONAL UNIT:	Chair Store			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	50	60	70

Design Intent

The Hall is one large flat floor location on campus where the whole school student community can gather for assemblies, award events, and similar large group functions. The Chair Store is required for storage for items of loose FFE (principally stacked chairs, but including space for stacked mobile staging, and possibly also stacked small exam desks) that are used in configuring the Hall for seated audience events. For a 3P School seating will be required for a minimum of 1,000 people, for a 4P school seating for a minimum of 1,300 people and for a 5P school seating for a minimum of 1,600 people.

Operational factors to consider

Direct adjacency to and connection with the Hall.

Proximity to other locations where quantities of loose seats may be required from time to time .

It can be expected that this space will be normally crowded with stacked furniture and other items in storage. ICT equipment (cabinets, routers, etc.) and engineering equipment, (switchboards, valves, meters, fire equipment) must not occupy floor or wall space in the Chair Store.

Functional Requirements

Double doors or roller shutter connecting this space to the Hall. Doors through to Hall should be located so that it they do not impede the function of any other of the connecting units.

Hard wearing floor surface resilient to the expected heavy weights and abrasion caused by the repeated removal and replacement of stacked metal framed seats.

Resilient durable walls and ceiling linings to maintain a reasonably dust free storage environment.

Specific functional requirements**Spatial layout:**

- Clear floor area at same floor level as the Hall

Visibility: N/A

Acoustics: N/A

Hydraulics: N/A

Fitout: N/A

ICT: N/A

Security:

- Locking to all doors
- Provision for community access

Multi-Purpose Hall: Music

FUNCTIONAL UNIT:	Music Learning Space			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² (total area provision includes the music store)	120	120	120

Design Intent

Music education is an integral part of the Primary School curriculum. The Learning Space for Music must support learning and teaching activities where students (as individuals or in small to large groups of 30 students) engage in listening, developing vocal, instrumental and compositional musical skills and expressing ideas through improvising and composing and performing music – as individuals or as members of ensembles.

Opportunities

Consideration must be given to a range of indoor and outdoor performance spaces located with or proximate to Music Learning Spaces and Music Storage. These features include:

- enabling the Music Learning space to be connected with the Hall
- external amphitheatre setting

Operational factors to consider

Many Music activities (such as amplified instruments and drums) generate loud to very loud, high and low frequency sound levels that must be contained at source. The design must provide complete acoustic isolation to bounding walls, floors and ceilings around spaces used for regular or occasional music performance so that noise does not interfere with other school activities. The interior of these spaces must be acoustically treated to control reverberation.

Functional requirements

A variety of large and small spaces are needed to allow students to learn music theory and practice and participate in Music activities in small to large groups (up to 30 students) and as individuals (instrument practice) and in 1:1 or 1:2 tuition. The Learning Space for Music must include and support:

- Music Learning Space of 80 m²
- 2 Practice Rooms (10 m² each)
- Music Store of 20 m²
- “Teaching Wall” for projection and technology (including whiteboards)
- Recording technologies

Ensemble singing and instrumental music activities may include student groups of 3 – 5 up to a school band or school choir of 35 or more. To support these activities, the Music Learning Space is located with direct access to the Hall and Stage.

Music tuition and performance will involve a wide range of musical instruments that require space within Learning Spaces (when the instruments are in use), and storage when the Learning Spaces are used for different purposes or for other instruments.

Storage adjoining the Music Learning Space is essential. Storage must be configured and fitted out to allow the tidy, safe and secure storage and retrieval of large numbers of instruments in a wide range of sizes and quantities, including class sets of small instruments (such as percussion or woodwind), tutorial sets of medium sized instruments (such as electronic keyboards or stringed instruments) and large individual instruments (such as a piano or a drum kit). Secure storage will be required for accessories (music stands, amplifiers and speakers, portable sound systems, etc.) and for the temporary storage of instruments owned by students participating in specific instrument tuition.

Specific functional requirements

Spatial layout:

- facilitate ease of movement of musical instruments from storage location out to all locations where they will be used
- ensure readily adaptable layout to accommodate different sized groups and different modes of teaching and learning

Visibility:

- clear views into the Learning Space from Hall
- line of sight throughout the Learning Spaces, including Practice Rooms
- line of sight from recording room space into adjacent performance space
- daylight required, but provision for screening (for dimming of light levels)
- appropriate treatments for external windows

Acoustics: (refer Technical Specification)

- be able to be acoustically contained bounded by soundproof walls, doors and with acoustic treatment to moderate noise level and reverberation in the space in accordance with the requirements of the Technical Specification

Fitout:

- provide accessible spaces to support inclusion of students with additional needs into the learning environment
- be supported by an appropriate number of power and data outlets
- secure storage (minimum 20m²) must be provided in two spaces, enabled with storage joinery, racking and open floor storage space
- Mirrors maybe required in Practice Rooms to assist students manage posture and instrument technique

ICT

- power and data outlets to service digital and electric music equipment, and telephone
- wireless coverage
- AV display

Security (Refer Technical Specification)

- Physical security at doors to isolate spaces, and to secure store rooms

Multi-Purpose Hall - PE Store

FUNCTIONAL UNIT:	PE Store			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	50	50	50

Design Intent

Provision of tidy, organised, easily accessible storage for the school's indoor sports and fitness equipment, outdoor sports and fitness equipment, and storage for items of loose FFE that are used in the Gym.

Operational factors to consider

Direct connection to the Gym.

Direct adjacency to external circulation space, with convenient path of travel to external play and sports areas.

Convenient access for deliveries and for movement of equipment outdoors.

Security for stored equipment.

Functional requirements

Secure cupboards with adjustable shelves, fitted joinery, cages, bins, racks, pigeon holes, wall brackets, racking and adjustable shelving for the storage of the school's stock of sporting equipment and physical education resources, which may include but is not limited to:

- Balls of various sizes, from tennis balls to footballs to basketballs
- Class sets of tennis racquets, badminton racquets, hoops, ball pumps, cricket equipment, gymnastics equipment
- Goal posts, nets and net posts for indoor sports (netball, volleyball, badminton)

Open floor space for storage of large items such as:

- Stacked gym mats
- Vaulting horses, springboards, mini-trampolines, balance beams, parallel bars, table tennis tables, hurdles

Doors connecting this space to the Gym and to the exterior of the building.

ICT equipment (cabinets, routers, etc.) and engineering equipment, (switchboards, valves, meters, fire equipment) must not occupy floor or wall space in the PE Store.

Specific functional requirements

- Wall mounted storage and clear floor area for additional storage

Visibility: Not applicable

Acoustics:

- No acoustic requirements for interior of the Store

Hydraulics:

- No requirements

Security:

- Locking to all doors and roller shutters
- PIR/ Intruder detection

Fitout:

- Fitted joinery, cages and racking as described
- Whiteboard and pinboard
- Resilient, durable and easily cleaned floor, noting that sports equipment may be brought in wet from outdoors, and heavy equipment may be dragged over the flooring
- Resilient durable walls
- space for storage of large sunscreen dispenser and paper towel dispenser adjacent

ICT

No requirements

Multi-Purpose Hall - Amenities and Change Rooms

FUNCTIONAL UNIT:	Amenities and Change Rooms			
FUNCTIONAL AREA:	Multi-Purpose Hall			
Min Nett Area:	Permanent buildings provided for a Primary school size of:	3P	4P	5P
	m ²	60	60	60

Design Intent

The student male and female Change Room's primary function is for the use by the school for students to change before and after their PE classes and must be designed for this purpose. The Change Rooms may also be used by the community out of normal school hours.

If the Gym is used out of school hours by the community it must be zoned so that the users are contained to limited areas with the remainder of the school locked and inaccessible. Provision of toilets within the out of school hours zone must be aligned to user numbers in the Gym.

Operational factors and Functional requirements

At different times, children or adults will use the Change Rooms and the toilet and shower facilities. These facilities must be separated and configured as:

- Change Rooms - Male and Female student Change Rooms, each sized to accommodate a minimum of 20 students (30m² min), with bench seating with hooks above in each changeroom
- No Toilet or shower facilities in the Change Rooms
- Change Rooms must be located adjacent to the student entry area of the Gym, with **No** direct access from the main Gym floor area. This is to reduce the likelihood of unauthorised access to the rooms
- Separate student toilet facilities (including one unisex) require access that is only from inside the Gym area with direct line of sight to toilet entry. This provides passive supervision for safety
- Separate staff and DDA compliant amenities, with shower (with curtain and fold down shower seat), handbasin, mirror, hand dryer, and with additional space for dry clothes to be stored on a bench that will not be affected by spray from the shower, are required with proximity to the Staff Workspace
- A separate Cleaner's room

Specific functional requirements

- Compliance with NCC for sanitary facilities, including ambulant accessible facilities and fully accessible facilities
- Mechanical ventilation
- Slip resistant flooring

Fitout for Change rooms

- bench seating
- bag hooks

2.4 Functional Specifications for the whole school use facilities

2.4.1 Leadership, Administration and Staff Centre

FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	484	528	581

Overview

The Leadership, Administration and Staff Centre acts as the central focal point for the public, parent reception, leadership, administration. It serves the needs of the entire school.

The Functional Units described below should generally be provided within one building. The size and location of these spaces may be varied when an alternative design is accepted as providing a superior solution. The alternative design must be supported by a rationale and a clear demonstration that there is no loss in functionality or amenity.

Functional Units in the Leadership, Administration and Staff Centre

	3P	4P	5P
	from Circulation	from Circulation	from Circulation
• Reception/foyer (including air-lock)			
• General Office	50 m ²	50 m ²	60 m ²
• Administration Store	35 m ²	35 m ²	40 m ²
• Sick Bay	25 m ²	25 m ²	25 m ²
• Uniform Store	10 m ²	10 m ²	10 m ²
• Leadership Area	55 m ²	75 m ²	75 m ²
• Business Manager's Office	15 m ²	15 m ²	15 m ²
• Conference Room	30 m ²	30 m ²	30 m ²
• Meeting Room(s)	12 m ²	12 m ²	24 m ²
• School Psychologist office	15 m ²	15 m ²	15 m ²
• Allied Support Staff Office	12 m ²	12 m ²	12 m ²
• Multi-Faith Room	10 m ²	10 m ²	10 m ²
• Staff Lounge	80 m ²	100 m ²	120 m ²
• Staff Retreat Room	10 m ²	10 m ²	10 m ²
• Facilities Management Workroom	35 m ²	35 m ²	35 m ²
• External Store (located with Waste Facilities)	20 m ²	20 m ²	20 m ²
• Circulation (excludes Ex. Store)	70 m ²	74 m ²	80 m ²
• Staff and Visitor's Amenities	must be added to total		

Refer to subsequent room sheets for specific functional requirements

Operational factors to consider

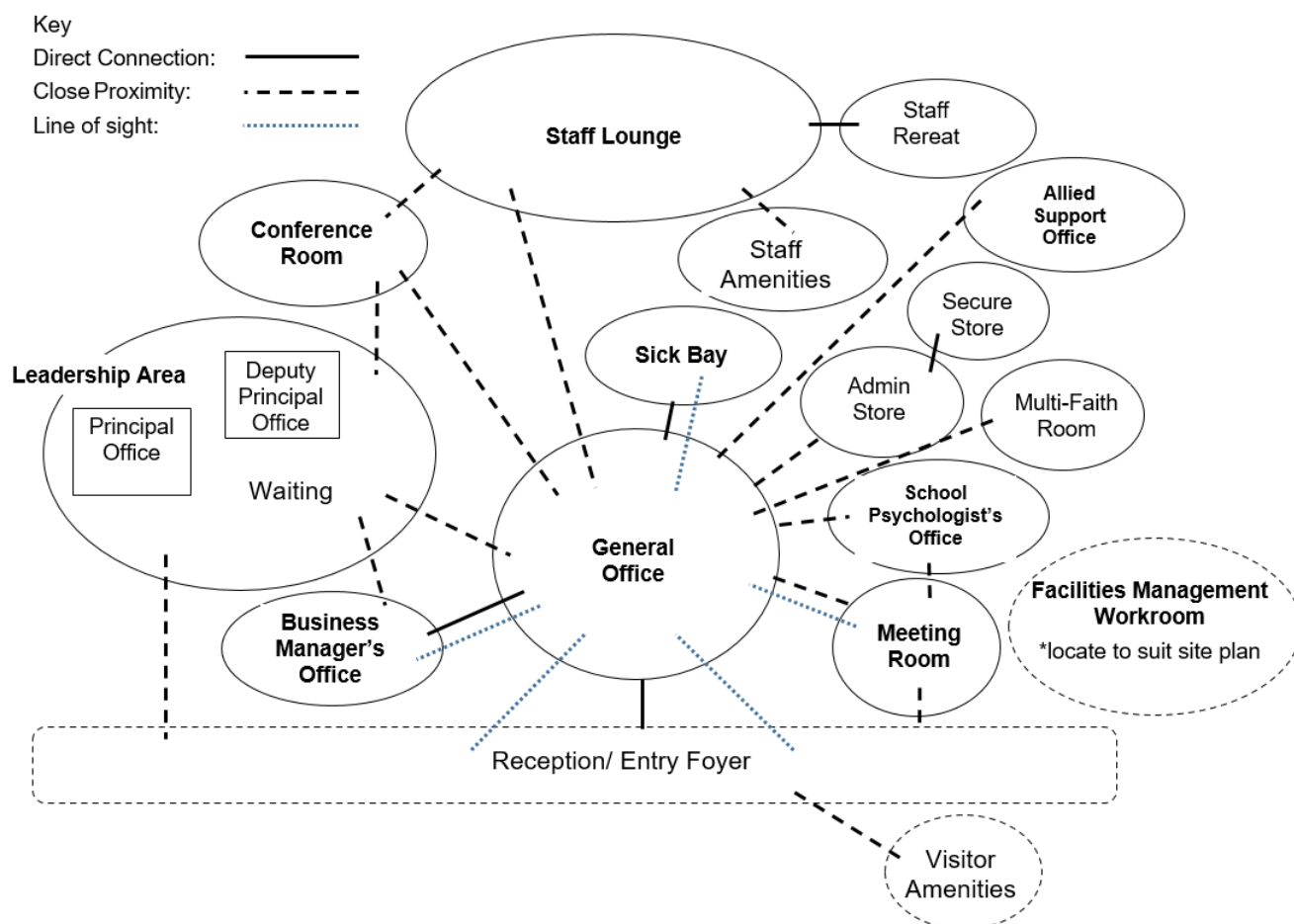
The Leadership, Administration and Staff Centre can be intensely busy at specific peak times – before school starts at breaks and after the school's finishing time.

Wayfinding signage and ease of flow of people in and out of this functional area and within the area are important factors to consider.

Narrow corridors that constrict the free flow of people must be avoided.

Important lines of sight must also be considered for the efficient operation of the General Office and privacy considerations for the Leadership Offices.

Figure 11: Functional Relationship Diagram - Leadership, Administration and Staff Centre



Leadership, Administration and Staff Centre – Reception and General Office

FUNCTIONAL UNIT:	Reception and General Office			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ² [Area for foyer and waiting to be allocated from circulation]	50	50	60

Design Intent

The Reception area and General Office monitor the School's point of entry and are the first point of contact for parents and visitors. These spaces set the tone for the atmosphere and identity of the school. The reception/foyer area 'presents' the school to parents and visitors. It can serve a number of functions, for example:

- a gallery for displaying student creations, information, school events, school values and vision, awards and trophies, memorabilia and historical artefacts
- a waiting area for parents, visitors and tradespersons
- processing the registration and admission of school visitors and tradespersons
- receiving mail and small deliveries

The General Office is the administrative hub for the school. It supports a range of clerical and administrative functions needed for the operation of the school including communicating with the school and providing a service counter to deal with enquiries and service needs from visitors.

Operational factors to consider

At peak times, the staff in the General Office can be busy responding to a range of school operational and administration functions and coordinating processes such as receiving and processing payments from parents and students, whole school communication, information distribution and possibly a school uniform outlet. The safety and security of staff at Reception is an important consideration while maintaining an open, welcoming feel and supporting the delivery of Reception and General Office services. A lesson learned from the Covid19 pandemic, the service counter must be designed so that transparent infection control screens can be simply installed – allowing conversations to be conducted and the transfer of documents while at the same time providing protection to users.

The school may use a digital screen interface for the sign-in/out process for visitors and tradespeople.

Note: The design for the Reception area must be signed off by the EDU WHS advisor to ensure minimum level of security is achieved.

Functional requirements

The location, layout and fit out of the Reception is required to:

- be located at the main entrance and be visible from the entrance doors
- As a high-flow traffic area, entry must be designed as an airlock for security purposes and to mitigate thermal discomfort and ingress of external pollutants to the foyer and reception area
- have direct view lines over the main entrance doors
- be accessible to the general public without adversely affecting the security of the school
- include bench space on the visitor side of the reception counter for a digital interface/tablet device for visitor sign-in/out
- include a foyer area that provides an air-lock and waiting space for up to 6 – 8 people (standing, seated and with prams or using mobility aids)
- provide a display of school information and showcase student learning and achievements
- open directly to the entrance foyer/reception for queries from while still providing clear access to the internal circulation network via a security door controlled from the General Office
- have a service counter(s) that provides sufficient space for staff to attend to two or more tasks, can be accessed readily by all potential users, adults or students, including those using wheelchairs and

without obstructing circulation

- be located near the Principal's Office but not necessarily directly accessed to it
- Located with the Business Managers office with direct line of sight throughout the General Office

The location, layout and fit out of the General Office is required to support:

- a range of administrative functions including filing, printing, preparing and compiling information, reporting, recording and storing
- administrative staff working as a team and/or individually at workstations which afford some privacy from visitors and students

A Server Room must be provided for the General Office. The Server Room must comply with ACT Shared Services requirements for an ICT Server Room as described in the Technical Specifications and the referenced SSICT documents.

Specific functional requirements

Spatial layout:

- Enable ease of circulation around general work areas and workstations
- Sufficient space at work stations for reference material/documents, writing and computing occurring side-by-side
- Sufficient space for Photocopier (MFP)

Visibility:

- Reception staff readily visible from school access area and school main entry and vice versa
- Abundant natural light, control of glare and direct sunlight
- appropriate treatments for external windows

Acoustics: [Refer to Technical Specification]

- Reception staff voice(s) clearly audible at the access side of the counter and vice versa
- Telephone and staff to staff conversations within General Office not intelligible in adjacent areas

ICT [Refer to Technical Specification]

- AV screen in foyer/waiting area to display for school information
- Data point for electronic sign-in of parents and visitors
- Data point for point-of-sale card reader
- Data point for Photocopier
- BMS head end computer
- Distributed power and data to service work stations
- Wireless access throughout foyer and reception to allow for changing layouts and flexibility
- Information display

Fitout:

- Waiting space for visitors in waiting area (including seating for 4-5 and space for a wheelchair or pram)
- Flat surface for form completion in waiting area
- Clearly identifiable reception counters of appropriate height for parents/visitors, students and wheelchair access [Refer Technical Specification]
- Workstations for the number of administration staff – consider a mix of standing and desk height
- Deep bench area for collating, compiling
- Open shelf storage—under bench and overhead
- Closed full height storage including some lockable storage
- Height adjustable, swivel office chairs for each General Office staff member plus additional seating for working meetings with other staff members
- Display boards, display cabinet in foyer/waiting area
- Display boards in General Office
- Clock

Security [Refer to Technical Specification]

- Appropriately located Emergency Management System point (Evacuations and Lockdowns)
- Intercom to front entry and ability to open, close and lock entry doors from reception
- Consider security of Reception Staff
- Secure service counter including lockable cash drawer

Leadership, Administration and Staff Centre - Administration Store

FUNCTIONAL UNIT:	Administration Store			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	35	35	40

Design Intent

The Administration Store is for general and archival storage purposes. It also includes an adjoining separate, smaller (8m²) Secure Store for the storage of confidential material such as student records.

Operational factors to consider

The Secure Store (8m²) is only accessible to office staff and school leaders. It cannot house any function that requires access by anyone other than office staff or school leaders. Equipment that is a potential fire source, or equipment that needs regular or periodic access by contractors (such as switchboards, meters, ICT equipment racks) must not be located in either Store.

Functional requirements

The Administration Store is required to:

- be located close to, and easily accessible from the General Office
- store files, documents and records which are confidential, valuable or both
- store boxed files and paper records that are heavy
- store consumable items

Specific Functional requirements**Spatial layout:**

- Ensure ease of access to all shelving and storage

Acoustics:

No specific requirements

Visibility:

- Zero visibility into the room
- Items in storage cabinets, shelves clearly visible
- Lighting to ensure visibility in all areas of the room

ICT:

- Wireless coverage

Security: [Refer Technical Specification]

- Lockable door(s)

Fitout:

- Solid core fire rated door
- Adjustable shelving
- Filing Cabinets
- Safe (lockable)
- key safe in Secure store

Leadership, Administration and Staff Centre - Uniform Store

FUNCTIONAL UNIT:	Uniform Store			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	10	10	10

Design Intent

The Uniform Store is for storage of school uniforms for sale. Associated displays may be located in the General Office or in a display case in the entry Foyer.

Operational factors to consider

Sale of uniforms will be operated by General Office or parent helper (P&C).

The Uniform Store is provided for the storage of uniform stock and selection and fitting of articles of clothing. Purchases may be transacted at the General Office Service Counter.

Functional requirements

The Uniform Storage is required to:

- be located close to, and easily accessible from the General Office, where purchases will be paid
- be located close to, and easily accessible from the Reception Foyer
- have fitting room privacy
- be configured to store all items of uniform, organised by item and size

Specific Functional requirements**Spatial layout:**

- Access for parents and students to enter the Uniform Store without entering the General Office area
- Service counter and roller shutter
- Ensure ease of access to all storage
- Door width suited to delivery of boxes of uniform articles

Fitout:

- Full height adjustable shelving plus hanging racks for some uniform articles
- Provision of curtained cubicle for fitting room
- Seat or bench and mirror in fitting room

Visibility:

- Passive supervision of door to Uniform Store from General Office
- Ensure visibility of all shelves and areas of storage
- Items clearly visible on open shelves

Acoustics:

No specific requirements

ICT:

- Wireless coverage

Security: [Refer Technical Specification]

- Lockable door(s)

Leadership, Administration and Staff Centre – Business Manager's Office

FUNCTIONAL UNIT:	Business Manager's Office			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

The Business Manager's Office is for use by the school's Business Manager. The Business Manager's work includes leading and managing the administration staff, human resources functions and financial management and administration. At times, the office will be used for small group meetings with the Principal or other leadership staff, staff and/or visitors. At other times it will be used for administration and business tasks requiring uninterrupted concentration.

Operational factors to consider

The Business Manager's Office needs to be accessible but also have the potential to be made private for confidential conversations and for work focus.

Functional requirements

The Business Manager's Office is required to:

- be located to provide line of sight to the front reception for supervision and support of the General Office
- to be easily accessible from the Principal's Office
- be accessible to external visitors only after signing in at Reception
- support both small group meetings and individual and pair work at a work station or desk
- provide a high degree of acoustic isolation to ensure confidentiality of conversations

Specific Functional requirements**Spatial layout:**

- Ensure ease of movement between different work areas
- Ensure ease of access to all shelving and storage

Visibility:

- Abundant natural light
- visual connectedness to adjacent circulation area
- appropriate treatments for external windows

Fitout:

- a height adjustable desk/workspace for a desktop computer with dual screens as well as adjacent paperwork
- a height adjustable, swivel office chair
- an upright visitor chair
- open shelving to hold books and A4 ring-binder folders vertically
- lockable cupboard or cabinet
- filing cabinets
- seating for two-three people plus the Business Manager
- display areas – noticeboard and whiteboard

Acoustics: [Refer Technical Specification]

- capable of acoustic isolation when doors and windows are closed

ICT:

- power and data to service work station
- wireless coverage

Security: [Refer Technical Specification]

- Secure room/ Lockable door(s)

Leadership, Administration and Staff Centre – Leadership Area

FUNCTIONAL UNIT:	Leadership Area			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	Total area for Leadership Team (m ²)	55	75	75

Design Intent

The Leadership Area includes offices for the Principal and Deputy Principal(s). The Leadership Area has a range of functions:

- individual work
- meetings with staff, students and parents (including meetings of a highly confidential nature)
- meetings with other leaders and the leadership team
- planning and developing professional learning activities
- developing and documenting school policies and practices
- administrative activities

Support for these functions can be provided in a number of ways using a combination of settings that can be used as individual work areas, collaborative work areas, and private meeting rooms.

Flexibility in the design should allow of different configurations to be used by the school. For example, a space that serves as a collaborative planning space adjoining two Deputy Principal Offices in one school may serve as the main work area for the Deputy Principals with two adjacent meeting rooms.

The area used by the Leadership staff to meet with parents and visitors must present a professional look and instil confidence and pride in public education.

Operational factors to consider

While needing to be central and accessible to school staff and students, the layout of the Leadership Area requires a level of security and seclusion from visitors, with all external visitors being required to first report to the Reception/General Office.

Functional requirements

The location, layout and fit out of the Leadership Area is required to:

- provide a separate Principal's office of 20 m²
- provide a one separate Deputy Principal's office of 20 m² for the 3P school and two separate Deputy Principals' offices each of 20 m² for the 4P and 5P Schools
- each office requires two points of egress
- be located centrally to both the main school functional areas and the Administration Area—General Office and Business Manager's Office
- student access from internal circulation space
- provide a lockable entry/exit to the Leadership Area that does not require access through the public Reception area
- provide a private meeting room accessible to all leaders
- be fitted out to support individual work stations
- storage for individual work related documents resources
- secure storage for personal belongings
- storage for resources used by the leadership team
- have a small waiting area for 2 – 3 students or visitors

Specific Functional requirements**Spatial layout:**

- enable ease of movement between individual and meeting spaces

Fitout:

- display areas – noticeboard, whiteboard appropriate to the function of each space

Visibility:

- a degree of visibility into the private meeting room is desirable while maintaining the capacity to provide security and visual privacy when required
- abundant natural light, with control to limit glare and intrusion of direct sunlight
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- Office spaces will require acoustic isolation

ICT:

- Wireless coverage
- power and ICT connectivity for mobile and fixed computing devices and telecommunication
- backbone infrastructure to support AV display in collaborative spaces/meeting area which can be either mobile or fixed

- desks and workstations (consider a mix of standing and desk height) for the number of leaders and to suit the design
- open shelf storage—under bench
- closed full height storage including some lockable storage
- height adjustable, swivel office chairs for each leader
- a range of meeting tables appropriate to the design
- seating for meeting spaces
- display boards, display cabinet, AV screen in foyer/waiting area
- clocks in each office and meeting room

Security: [Refer Technical Specification]

Leadership, Administration and Staff Centre – Conference Room

FUNCTIONAL UNIT:	Conference Room			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	30	30	30

Design Intent

The Conference Room is a large multipurpose meeting room that will be used by:

- the school staff and students
- the School Board, P&C and parent groups
- members of the community
- by school staff and visitors for meetings and professional learning
- users needing a room configured for virtual conferencing

Operational factors to consider

Given that the Conference Room will be used by the School Board/P&C out of school hours, it is important that the Conference/Meeting Room be located from the main foyer without the need to enter the main secured area of the school.

Functional requirements

The location, layout and fit out of the Conference Room is required to:

- be located near the main entry and Reception
- accommodate 12-15 people meeting as one group
- be adaptable as required for the listed functions in the Design Intent above
- provide AV as per Learning Spaces
- be proximate to a space that is equipped to serve refreshments and pre-prepared food

Specific Functional requirements**Spatial layout:**

- sufficient space to enable ready circulation to any position around the meeting table with the majority of people already seated
- space for a presenter to stand between the table end and the presentation wall
- a wide rectangular room (for table fit out) is preferable to enhance communication, and to allow the seated attendees to have a view of the presentation wall(s)

Visibility:

- a degree of visibility into and out of the Conference Room while maintaining the capacity for privacy and security
- abundant natural light, but with capacity to control of glare and eliminate direct sunlight
- controllable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- capable of acoustic isolation with doors closed

Fitout:

- an oval or round-end wide rectangular meeting table to seat capacity above
- height adjustable, swivel office chairs to suit the table
- display areas – noticeboard, whiteboard
- clock
- storage—under bench and overhead
- Kitchenette fitout only required if suitable facility is not located nearby

ICT: [Refer Technical Specification]

- backbone infrastructure to support multi-media presentations and video conferencing
- AV as per Learning Spaces
- phone data point

Security: [Refer Technical Specification]

- Lockable door(s)

Leadership, Administration and Staff Centre – Meeting Room

FUNCTIONAL UNIT:	Meeting Room(s)			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	12	12	24

Design Intent

The Meeting Room(s) will be used for multiple purposes, importantly a general meeting space for staff teams, a space where staff can hold interviews with parents and students and a space to meet other visitors.

Operational factors to consider

Given the potential for multiple users and multiple uses, these spaces need to be equipped to be Agile adaptable spaces.

Functional requirements

The location, layout and fit out of the Meeting room(s) is required to accommodate up to 6 people close to the front foyer that can be accessed without entering the secure area of the school.

2 meeting rooms are required for a 5P school.

Specific functional requirements**Spatial layout:**

- sufficient space to rearrange the furniture to suit the various functions—a meeting table setting

Visibility:

- visibility into and out of the Meeting Room while maintaining the capacity for privacy and security
- abundant natural light, control of glare and direct sunlight
- controllable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- complete acoustic isolation to ensure privacy and confidentiality

Fitout:

- meeting table to suit intended group size(s)
- office chairs appropriate to the meeting table
- meeting setting to seat 6 people according to room size
- display boards for posters, information resources
- whiteboard
- clock

ICT: [Refer Technical Specification]

- power and ICT connectivity for mobile and fixed computing devices and telecommunication

Security:

- No specific requirements

Leadership, Administration and Staff Centre – School Psychologist Office

FUNCTIONAL UNIT:	School Psychologist			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

The School Psychologist's Office is a private space to meet with up to four other people for private discussions, write up reports and store files and resources. It will be used for confidential meetings and for counselling students.

Operational factors to consider

Students and staff generally need a degree of privacy when visiting the School Psychologist.

Functional requirements

The location, layout and fit out of the School Psychologist's Office is required to:

- be located within the Leadership and Administration centre Functional Area
- accommodate up to five people (adults and students) seated comfortably
- include a desk, lockable filing cabinet and storage space
- provide secure storage for personal belongings

Specific functional requirements**Spatial layout:**

- sufficient space between the work desk and small meeting setting for flow between the areas
- provide personal space for five individuals

Visibility:

- a degree of visibility into and out of the School Psychologist's Room while maintaining the capacity for privacy and security
- abundant natural light, control of glare and direct sunlight
- controllable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- complete acoustic isolation to ensure privacy and confidentiality

Fitout:

- height adjust able desk or individual work station
- height adjustable, swivel office chair to suit the work desk
- storage—files, books, folders, School Psychologist's resources
- a small meeting setting to seat five people comfortably around a coffee table or equivalent
- display boards for posters, information resources
- whiteboard or writeable surface

ICT: [Refer Technical Specification]

- power and ICT connectivity for mobile and fixed computing devices and telecommunication
- power outlets must be located as close as possible to ground level in this office

Security: [Refer Technical Specification]

- This office must be individually keyed and to master key

Leadership, Administration and Staff Centre – Multi-Faith Room

FUNCTIONAL UNIT:	Multi-Faith Room			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	10	10	10

Design Intent

Prayer is an important part of religious belief for many Australians, and in a School both members of staff and members of the student community may have need of a space for prayer and religious observance during school hours.

The School must provide a non-denominational space that can be used for multi-faith prayer and religious observance by up to 4 persons. The space will be an un-adorned, non-directional space with a neutral aesthetic, which can be adapted and serve for religious or spiritual practices for a range of faiths.

Operational factors to consider

Accessible to all students, but in a quiet precinct.

Prayer observances may include solo quiet reflection and group vocal prayers. Acoustic and visual privacy is required, with a small lobby separating the prayer room from a circulation corridor.

Hand and feet washing facilities are required.

The prayer room should be away from toilet amenities.

Functional requirements

- Diffuse lighting including daylight
- Carpeted floor
- Hand and feet washing Basins
- Acoustic treatments to control reverberation
- Visual treatments to ensure privacy
- appropriate treatments for external windows
- Small lockable storage cupboard, accessible from the lobby
- Signage frame in the lobby, allowing a printed daily booking schedule to be displayed and changed as required

Leadership, Administration and Staff Centre – Allied Support Staff Office

FUNCTIONAL UNIT:	Allied Support Staff Office			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	12	12	12

Design Intent

Provision of shared office space for use by visiting consultants and specialists. In addition to the School Psychologist, the school may have frequent visits from visiting consultants and specialists such as Occupational and Speech Therapists, Social Workers and Learning Support Assistants.

Functional requirements

The location, layout and fit out of the Specialist Consultant's Office is required to:

- provide hot desk type temporary workspace for visiting consultants, with fit out permitting two consultants to concurrently use the office
- be located near, but not directly connected to the General Office, and near to the School Psychologist's Office
- include two desks or workstations, storage space, and access to networked printers and photocopiers in the Staff Resource room

Specific functional requirements**Spatial layout:**

- space for two adults to work and access workstations in a shared environment

Visibility:

- a degree of visibility into and out of the Office while maintaining the capacity for privacy and security
- abundant natural light, control of glare and direct sunlight
- controllable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- complete acoustic isolation to ensure privacy and confidentiality

Fitout:

- desk or individual work station
- height adjustable, swivel office chairs to suit the work desk
- storage—files, books, folders,
- display boards for posters, information resources
- whiteboard or writeable surface

ICT: [Refer Technical Specification]

- power and ICT connectivity for mobile and fixed computing devices and telecommunication

Security: [Refer Technical Specification]

- lockable office

Leadership, Administration and Staff Centre – Staff Lounge

FUNCTIONAL UNIT:	Staff Lounge			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	80	100	120

Design Intent

The Staff Lounge provides a central relaxation and social gathering space for all school staff and is an important Functional Unit for building a whole-school culture. It is intended to provide an adaptable space to be used at break times, before and after school and as a retreat space for staff. It can also be used for planning meetings and professional learning.

Operational factors to consider

With the integration of Staff Workspaces into the Learning Settings and the sharing of school information via email, there has been a tendency for teachers to spend most of their time in the Learning Settings. The staff Lounge also provides a location for whole-school culture events such as morning teas, and special events days. It is important to consider functionalities that can be integrated with the Staff Lounge, for example a Professional Learning Centre that houses resources, displays of the school's strategic plan, etc.

Functional requirements

The location, layout and fit out of the Staff Lounge is required to:

- be located centrally
- be located near the Leadership Area
- provide a retreat from the student areas while still occupying a central position
- accommodate all staff plus visiting and temporary personnel at long term and enrolment staff numbers
- have restricted public access
- provide a welcoming, relaxed environment
- facilitate cohesion across the whole staff cohort
- include a kitchen area sized to serve the staff numbers at peak times during the day (breaktimes) and other facilities for casual use by staff

Specific functional requirements**Spatial layout:**

- sufficient space to enable ready circulation around the beverage, food drink area
- a wide rectangular room is preferable to a long thin room to enhance community
- Space must be provided for waste bins (green waste, recycling and landfill)

Visibility:

- Abundant natural light, control of glare and direct sunlight
- controllable lighting
- appropriate treatments for external windows

Acoustics: [Refer Technical Specification]

- capability to contain sound into/out of the space

ICT: [Refer Technical Specification]

- power and Wi-Fi
- AV as per Learning Spaces

Fitout:

- Several small settings of comfortable lounge chairs/coffee tables
- A variety of bench areas such as standing height benches, large 'kitchen bench'
- 2 refrigerators/freezers
- 2 microwaves placed at bench top level
- A wall oven
- 1 dishwashing machine
- Adequate bench space and storage space for supplies, and all necessary kitchenware
- 2 boiling and chilled water dispensers
- A minimum of two separate one bowl/two drainers stainless steel sinks
- Large noticeboards for display
- Whiteboards

Leadership, Administration and Staff Centre – Staff Retreat Room

FUNCTIONAL UNIT:	Staff Retreat Room			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	10	10	10

Design Intent

The Staff Retreat Room provides a retreat room and rest space for staff. This room can be used for a variety of purposes—caring for/feeding babies; a prayer room; a rest space for someone feeling unwell.

Operational factors to consider

Schools will define their particular use of this space depending on the needs of their staff. Therefore, the space needs to be readily adaptable for different intents and uses, including those described above.

Functional requirements

The Staff Retreat Room is required to:

- be located adjacent to and readily accessible from the Staff Lounge
- adjacent to staff toilets
- provide comfortable furniture for sitting or reclining
- provide a degree of privacy for users
- provide facilities for hand washing
- include storage for First Aid equipment and supplies

Specific functional requirements • Spatial layout: • Ensure space for manoeuvring a wheel chair • Visibility: • Controllable natural light • Viewing panel from outside with visibility control • Signage indicating occupation or vacancy • appropriate treatments for external windows • Acoustics: [Refer Technical Specification] • Able to be acoustically contained/separated • Security: • Privacy latch to door • First Aid cabinet lockable	Fitout: [Refer Technical Specification] • one couch • additional seating/ coffee table • first aid cabinet and kit – wall hung, lockable • wall hung hand basin with hot and cold mains water • soap and paper towel dispensers • medical waste and sharps containers • bench top suitable for nappy change • under bench bar fridge with small integral freezer • carpet plus vinyl flooring in wet area ICT: [Refer Technical Specification] • Wi-Fi • Power
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Leadership, Administration and Staff Centre – Sick Bay

FUNCTIONAL UNIT:	Sick Bay and Student Toilet			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	25	25	25

Design Intent

The Sick Bay serves as a base for administering First Aid and as a temporary rest room for students who are injured or unwell.

Operational factors to consider

The Sick Bay requires direct supervision from the General Office. It also needs to be readily accessible for an ambulance trolley to and from the emergency vehicle parking bay.

The design of the Sick Bay facility in a Primary School is to be able to be divided into two separate bays, in order to allow the school to provide separation of students for gender specific privacy or age level separation if and when required.

First aid provision and health management in ACT schools utilises visual aids such as posters and charts. The First Aid Room would also hold A4 sized health management plans for students with recurrent health issues. Extensive provision of noticeboard material between 1200mm height and 2400mm height is required.

Materials selection and detailing must support regular cleaning to high standards of cleanliness, as appropriate for a space where simple medical treatments and first aid may be performed.

Functional requirements

The Sick Bay is required to:

- be located close to, and be readily supervised and accessed from the General Office
- accommodate up to two students in the room
- provide a degree of privacy for individual students using the Sick Bay
- provide a space where first aid can be administered
- adjoin a unisex DDA compliant toilet with a shower facility, which is directly accessible from the Sick Bay main area

Specific functional requirements**Spatial layout:**

- DDA accessibility compliance with space for manoeuvring a wheelchair
- Ensure ease of access to all areas of the sick bay to attend to sick students

Visibility:

- Controllable natural light to main Sick Bay area
- Direct line of sight supervision from the General Office

Acoustics: [Refer Technical Specification]

- Capable of being acoustically contained/separated

ICT: [Refer Technical Specification]

- wireless coverage
- clock

Security:

- Sick Bay room door not lockable

Fitout:

- One bed (with space provided for a second bed) [refer FF&E Specification]
- hospital curtain on suspended track for privacy between beds
- fully fitted large (100 people plus) first aid cabinet and kit – wall hung, lockable
- bench top with inset stainless steel single bowl sink and drainer, hot and cold mains water, lever tap, cupboards underneath
- recess for small under bench bar fridge with small integral freezer, easily cleaned splashback over bench top, matching length overhead cupboards – lockable
- soap, hand sanitiser and paper towel dispensers
- medical waste's and sharps containers
- display board and white board
- vinyl flooring with integral self-coved skirting

Leadership, Administration and Staff Centre – Staff Amenities

FUNCTIONAL UNIT:	Staff Toilets (Male and Female), Change rooms, Showers			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	See Section 1.7.7 for toilet requirements			

Design Intent

The Staff Toilets are part of the Staff Centre and are readily accessible to staff using the Staff Lounge. The Staff shower and change area is integrated with the staff amenities in the Leadership, Administration and Staff Centre.

Staff showers and change rooms must be designed to provide the staff with End-of-Trip Cycling facilities in accordance with the requirements of the ACT Planning and Land Authority 'Bicycle Parking General Code' (refer Bicycle Parking General Code). Staff must be able to move directly from the external staff bicycle parking facilities to the staff change rooms.

Where this Functional Brief has a higher requirement than the Bicycle Parking General Code, the requirements of this Functional Brief shall apply.

Operational factors to consider

Approximately, the percentage of female staff in ACT primary Schools is 85%. At peak times, such as recess and lunch, the female staff toilets are in high demand. Consideration should be given to providing generous circulation space within and around the toilet area to prevent congestion and queues.

Consideration must be given to distributing staff toilets around the Learning Settings and staff use of DDA compliant toilets included in each Learning Setting.

Staff toilets and change facilities are to be single sex, with individual cubicles for changing to ensure privacy.

It is preferable that toilets be located on an external wall with natural ventilation if possible. Mechanical ventilation should also be provided.

Staff utilising the change rooms will need space to store a change of clothes (such as cycling gear). Clothing lockers (as described in the Bicycle Parking General Code) may be located in a recess along circulation space immediately adjacent to the showers / change rooms.

Functional requirements

The Staff Toilets are required to:

- be provided in compliance with NCC requirements
- be readily accessible from the Staff Lounge

Specific functional requirements**Spatial layout:**

- Sufficient space for movement in and out of the area, to gain access to the hand basin and hand dryers without obstruction
- Lobbies/airlocks to all staff toilets adequately ventilated to the external air

Visibility:

- Privacy to be considered if toilet lobbies open off an occupied Functional Unit - it is preferable that staff toilets and toilet airlocks do not open direct from the Staff Lounge.
- Placement of mirrors must be considered in context of entry door location, so that reflected view lines are managed to maintain privacy

Fitout:

- Wall to ceiling tiles or water resistant material
- hand basins with hot and cold mains water
- mirrors
- soap and hand sanitiser dispensers
- toilet paper and paper towel dispensers
- electric hand dryers
- coat hooks/ clothes hanging
- floor waste
- ventilation to the external air
- mechanical ventilation
- shower cubicles with drained base, screen or curtain, soap holder
- change area bench

Acoustics: [Refer Technical Specification]

- able to be acoustically contained, including noise from operating hand dryers

ICT: [Refer Technical Specification]

- no requirement

Security:

- Privacy latch to cubicles

- towel rack
- staff lockers
- waste bins
- impervious flooring with integral coved skirting – slip resistant surfacing

Leadership, Administration and Staff Centre – Facilities Management Centre

FUNCTIONAL UNIT:	Facilities Management Centre: Bulk Store and Workshop			
FUNCTIONAL AREA:	Leadership, Administration and Staff Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	35	35	35

Design Intent

The Facilities Management Centre is the coordination centre for all operations with regard to facilities management—caretaking of the total site, cleaning, maintenance, storage and break-down of bulk goods and equipment and consumable supplies.

In addition to office work, the Facilities Management Centre provides workshop functions for repair and storage of equipment and furniture.

Operational factors to consider

The bulk store will receive deliveries that range in size and weight. Consideration needs to be given to access to the delivery door and to facilitating the unloading of delivery vehicles. The Store will house a range of materials – paper and other clean dry materials, plus chemical goods, cleaning appliances and bulk storage of cleaning materials (liquids, sprays, consumables). The space will also serve as a maintenance workshop and may be used to workshop store tools and equipment.

The design **must also provide an external storage facility (20m²)** for a cleaning products, detergents, fuels, oils and the grounds maintenance equipment (mower, brushcutter, BBQ, gardening, ladders, etc.) located with the waste management facilities.

Functional requirements

The location, layout and fit out of the Facilities Management Centre is required to:

- be located close to the Leadership, Administration and Staff Centre
- be unobtrusive—not ‘front of house’
- be located in proximity to a vehicle path to accommodate heavy vehicle approach close to the point of delivery access
- provide efficient and accessible storage
- permit safe convenient unloading of delivery vehicles including possible manoeuvring of pallets using a hand operated pallet lifter
- provide four zones of usage – office zone, workshop zone with appropriate workshop facilities provision, and storage zone for stock requiring clean, dry, dust free storage conditions with heavy duty racking for bulk paper and consumables, and general storage zone for stock with no special requirements for storage, with heavy duty racking and open floor storage space

Specific functional requirements**Spatial layout:**

- Layout and room shape designed to create zones for office work, workshop, dry storage and general storage
- Bulk store either directly accessible from the office/workshop zone or integrated

Visibility:

- Bright light to all work areas
- Stored items readily visible
- Natural light and external view

Acoustics: [Refer Technical Specification]

- consider adjacent space(s) and contain workshop noise accordingly

Fitout:

- dry dust free workstations for two people
- storage cabinet
- storage for wet weather gear (coats, boots)
- filing cabinet
- heavy duty work bench 900mmH x 900mmW x 5000mmL with open shelving under
- wood and metal vices
- workshop tools and storage wall (shadow wall)
- lockable storage (~25% of all storage)
- adjustable open storage shelves

ICT: [Refer Technical Specification]

- wireless coverage
- data/power for fixed equipment and at workstation
- BMS computer interface (if BMS provided)

Security:

- lockable external doors (1.5 leaf person access door and metal roller shutter)
- lockable internal storage
- intruder detection

- storage racking (pallets and large items)
- full height storage walls and safe means of access
- stainless steel sink, 1500mm long, 2 bowls, hot and cold water
- hand wash facilities (basin, soap dispenser, paper towel dispenser)
- external – loading bay and/or ramp
- flammable cupboard for volatile liquids in external shed
- clock
- easily maintainable floor surfacing (epoxy sealer or similar)

2.4.2 Learning Resource Centre (Library)

FUNCTIONAL AREA:	Learning Resource Centre (Library)			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	300	360	410

Overview

Libraries primarily support access to information and learning resources and the sharing, creation and communication of knowledge and culture. As technology has changed the way students access, share, create and communicate information and knowledge, so too it has changed the specific functionalities of libraries.

A 'library' in a contemporary Primary School is not the traditional 'book repository'. On-line sources now provide students with faster and wider sources of information. The 'library' now functions as a learning resource centre - a whole-school use space where learners of all year utilise resources for research, work on team projects, as well the pleasure of reading. The main area can also be used for presentations, learning events for which the main area might be set up as a living museum, gallery or workshop space. The Learning Resource Centre is also still used for promoting and supporting an active reading culture among students, for meetings, seminars and for accessing and learning to use a variety of text and multi-media resources that assist learning.

Design Intent

The specific purposes of the centralised Learning Resource Centre provide opportunities to:

- access and engage with general learning resources for the school (including books, magazines and periodicals, charts, multimedia, ICT, etc.)
- provide a reflective space and atmosphere for research (individual and group) and reading
- Individual work, research and study
- research, debate, discussion and collaboration in small and medium sized working groups
- presentation and discussions in medium sized groups
- learning in virtual settings for small and medium sized groups using interactive ICT and AV, where the teacher or other members of the student group may be either physically present or in a remote location
- obtain assistance in 'knowledge navigation' and information about learning resources
- obtain assistance and guidance in social media management
- hold learning 'events', meetings and gatherings of small, medium, large and very large groups
- engage in games—virtual and board games

Opportunity: The Library is an ideal location within the School where information and opinions on major contemporary issues and public events can be presented. A visualisation space (room or alcove) could allow students to be kept informed and updated on a major and emerging local, national or global issue (with maps, links, images, quotations, and similar information presented and tracked as it changes).

Operational factors to consider

Libraries are often used as a social, recreational and/or retreat space during school break times. Complete line of sight visibility for passive supervision is required from all points of the Library.

Libraries can be used for out-of-school-hours school events. Areas of the Library that could be accessed and used by the community, without school personnel present, need to be accessible while still maintaining security to the main areas of the school. When the learning resource centre operates in out-of-school hours, it must be supported by access to toilet amenities and access to clear paths of entry and egress that do not depend on travelling into or through unoccupied school facilities.

The main area of the Learning Resource Centre must not be considered as a fixed landscape where specific activities occur only in defined locations. This main area must be an Agile space, that permits users to easily adapt furniture to create temporary settings that meet temporary needs (such as grouping reading chairs into a circle to

support a small group discussion or arranging two tables together to support group project work).

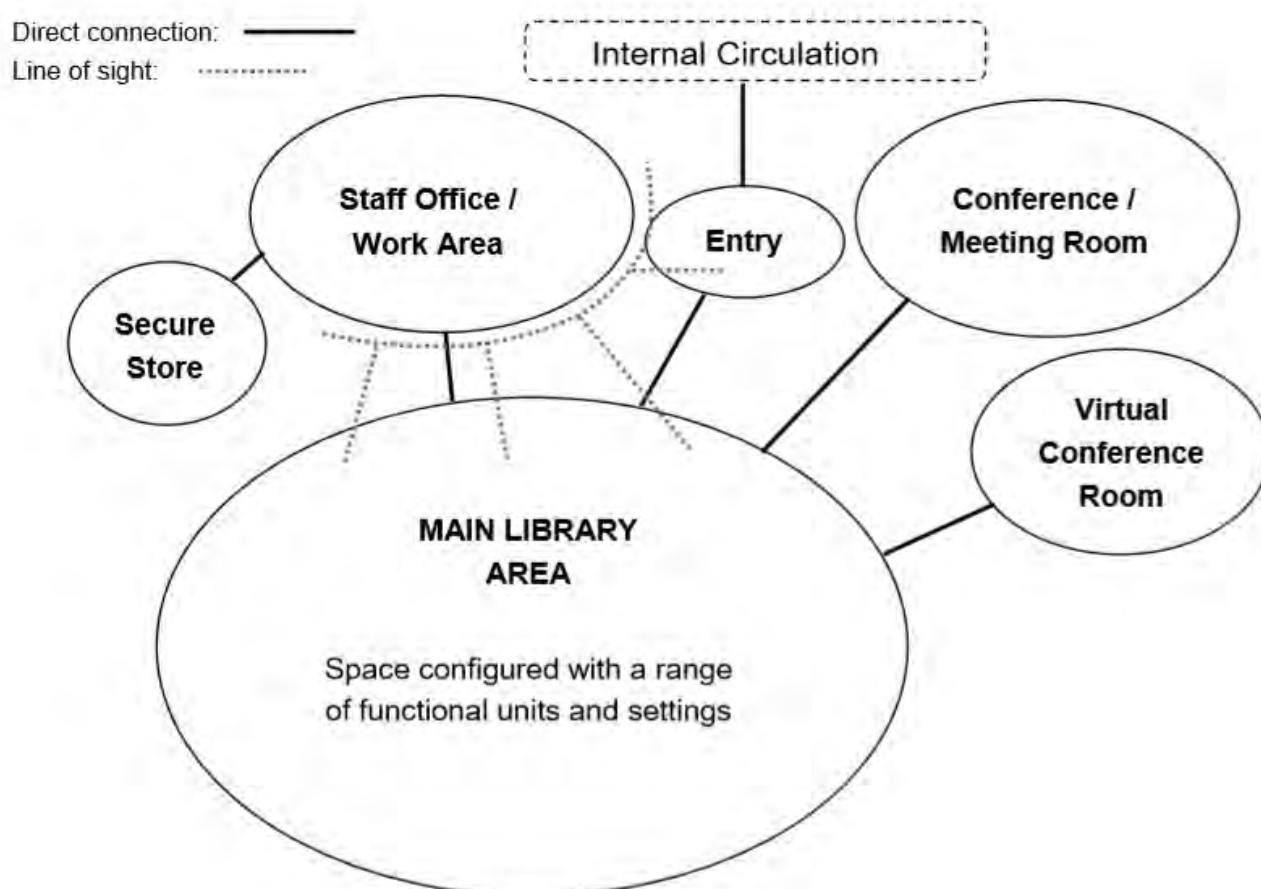
Functional Units – Learning Resource Centre

	3P	4P	5P
Main Library Area (includes circulation)	200 m ²	250 m ²	300 m ²
Entry Foyer	10 m ²	10 m ²	10 m ²
Meeting / Conference Room	30 m ²	30 m ²	30 m ²
Virtual conference Room	15 m ²	15 m ²	15 m ²
Staff Office/ Work Area	30 m ²	40 m ²	40 m ²
Secure Storage	15 m ²	15 m ²	15 m ²

These functional units contain:

- Staff work area with help desk
- Presentation and explicit teaching setting(s) for use by small, medium, large and very large groups
- Quiet, comfortable settings for reading—individual and reading groups
- Reflective settings for thinking, reading and research
- Settings for small collaborative groups around tables
- Settings for pairs, small groups collaborating around an AV display
- Display areas for a variety of resources—books, digital media, charts, student projects etc.
- Open access for a range of texts, digital resources and games
- Joinery for students to charge their devices
- Readily accessible student and staff amenities (if the Library is designed as a standalone building, additional amenities, including a DDA compliant toilet, are required to support zoned use outside of school hours)

Figure 12: Functional Relationship Diagram – Learning Resource Centre



Learning Resource Centre – Staff Work Area

FUNCTIONAL UNIT:	Staff Work Area and Secure Storage			
FUNCTIONAL AREA:	Learning Resource Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	30	40	40

Design Intent

The Library Staff Work Area is a space to support administration related to Library resources. It must be directly adjacent to a service counter/ help desk.

A library in a contemporary School has an 'open access' feel, and it is important that an open invitational atmosphere is conveyed.

Operational factors to consider

Adequate space for two or more people to be working in the Staff Work Area.

Good line of sight of the total Library area including entry and exit points is required.

Deliveries of books and resources may involve boxes and packaging that must be stored until there is time for unpacking and processing can be an untidy process. Consider the preparation of books and resources for use, and repair of damage as a function in this area.

Functional requirements

The location, layout and fit out of the Library Staff Work Area is required to serve the functions listed in the Design Intent and must include:

- 2 work stations
- a library materials/resources work area with hand washing facilities
- a service counter placed in the Main Library area which serves as help desk and for signing out and returning library resources
- a store room for:
 - general storage for equipment and materials
 - secure storage room (15m²) to store resources, materials and valuable equipment such as AV and ICT equipment

Specific functional requirements**Spatial layout:**

- sufficient space to enable ready circulation within the work area from storage to work bench when more than one person is using the area

Visibility:

- direct line of sight to all areas of the Library
- bright lighting to work area

Acoustics: [Refer Technical Specification]**ICT:** [Refer Technical Specification]

- wireless coverage
- data/power for desktop computer and networked printer/ photocopier (in Library office and at Service Counter)

Security: [Refer Technical Specification]**Fitout:**

- work bench with storage under for library resources
- full height lockable cupboard with adjustable shelving
- areas of notice board and whiteboard
- height adjustable workstation with sufficient space for a desktop computer and adjacent documents, books, etc
- open storage shelving sized to suit a range of sizes for resources
- hanging file–A2 size
- Book return chute and mobile book bin
- Collating table
- Clock

Learning Resource Centre – Library Main Area

FUNCTIONAL UNIT:	Library Main Area			
FUNCTIONAL AREA:	Learning Resource Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	200	250	300

Design Intent

The Library is required to serve a number of functions. Some functions require purposefully designed settings which serve limited functions while other functions can take place in an adaptable, multipurpose space.

Operational factors to consider

The Library can be used by many different sized groups —individuals, small, medium, large and - by opening glass doors connecting the main library area with the conference room.

At times, individual students might be occupying themselves with quiet reading, private study and research or homework, while several small groups are working collaboratively on a project, and an area is devoted to a display for a specific project being undertaken in one year group or a whole school event.

The Library can be used extensively at break times as a social space for quiet reading, board and computer games, relaxation and retreat. Schools might also use the Learning Resource Centre for student clubs —e.g. chess, science, art, debating, tech and book club.

Settings will require frequent rearrangement by depending on the activity and group size. The adaptability built into the design of the Library Main Area must be Agile.

Functional requirements

The main area of the library is required to serve the following functions:

- presentation and explicit teaching setting(s) for use by small, medium, large and very large groups
- quiet, comfortable settings for reading—individual, small groups, a reading circle or dialogue group
- reflective settings for thinking, reading and research
- settings for small collaborative groups around tables
- settings for pairs, small groups collaborating around an AV display
- extensive display and storage areas for a variety of resources—books, digital media, charts, games, student projects, wall displays, posters, book covers, etc.

While being a relatively open space, the layout of the Library Main Area is required to:

- be activated with loose and fixed furniture to support the functions listed above
- have line of sight supervision from the Library Help Desk/Staff Work Area
- be fitted with acoustic linings to moderate acoustic interference between different functional areas

Adaptable spaces within the main area that are intended to be used for different sized groups should be Agile with loose furniture items able to be moved by Primary school students.

The overall layout of the main area should be designed to be reconfigurable by adults without special equipment.

Specific functional requirements**Spatial layout:**

- as per the Functional Requirements above

Visibility:

- as in the above functional requirements

Acoustics: [Refer Technical Specification]

Security: [Refer Technical Specification]

Fitout:

- loose and fixed furniture
- Extensive pinboard and display surfaces
- Clock

ICT: [Refer Technical Specification]

- Power and data points for desktop computers/AV display
- wireless access (Wi-Fi)

Learning Resource Centre – Meeting / Conference Room

FUNCTIONAL UNIT:	Meeting / Conference Room			
FUNCTIONAL AREA:	Learning Resource Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	30	30	30

Design Intent

The Conference Room in the Administration Area is expected to be frequently utilised by the School Leadership. This Meeting / Conference Room is a space that will be used for multiple functions by the school.

To maximise its usefulness, it must be designed to be an integrated aspect of the Learning Resource Centre that can be opened up to the Main Library Area or closed off and secured from the Library depending on need. The ability to be opened to the Main Library Area will expand the area of the Library giving it a larger capacity for a school community event.

Operational factors to consider

Glass lockable doors between the Meeting / Conference Room and the Main Library Area must be robust and Agile to deal with frequent and regular use.

Functional requirements

The Meeting / Conference Room is required to be designed as an adaptable space that has the following functions:

- comfortably accommodate 15 people meeting as one group
- Acoustically isolated meeting space for student group working sessions
- Large group virtual meeting space

Specific functional requirements**Spatial layout:**

- sufficient space to enable ready circulation to any position around the meeting table with the majority of people already seated
- space for a presenter to stand between the table end and the presentation wall
- a wide rectangular room (and table fit out) is preferable to allow the majority of seated attendees to have a view of the presentation wall(s)

Visibility:

- visibility into and out of the Conference/Meeting Room
- natural lighting
- controllable lighting

Acoustics: [Refer Technical Specification]

- prevention of sound intrusion to and from adjacent spaces
- Security: [Refer Technical Specification]

Fitout:

- Suitable conference table or as individual tables for a small seminar or presentation
- Clock

ICT: [Refer Technical Specification]

- backbone infrastructure and hardware to support multi-media presentations and interactive video conferencing
- interactive AV display appropriate to depth of the viewing area and legible from all positions in the room
- phone data point
- MATV
- wireless access (Wi-Fi)

Learning Resource Centre – Virtual Conference Space

FUNCTIONAL UNIT:	Virtual Conferencing Space			
FUNCTIONAL AREA:	Learning Resource Centre			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

Virtual Conferencing Space can be used for a general meeting space, a quiet room for focussed activities, a small space for groups of students and/or for student meetings and clubs. It also provides a space for virtual conferencing and distance learning.

Operational factors to consider

Given the various uses of this room, ready adaptability of light and visibility is required. The layout of the room and AV equipment must maximise the inclusion of all occupants in the viewing area.

Functional requirements

The location, layout and fit out of the Virtual Conferencing Space is required to:

- be located adjacent to, and be directly accessible from the Main Library Area
- be equipped for virtual conferencing
- accommodate up to 8 people seated at a meeting table

Specific functional requirements**Spatial layout:**

- sufficient space to enable ease of movement around the meeting table when most people are seated
- maximise the inclusion of all occupants in the viewing area

Visibility:

- line of sight supervision from the Main Library and staff Areas
- controllable lighting for video conferencing and AV presentations

Acoustics: [Refer Technical Specification]

- complete acoustic isolation for effective communication online and to prevent sound intrusion into the adjacent space(s)

Security: [Refer Technical Specification]**Fitout:**

- meeting table
- office chairs appropriate to the meeting table
- display board
- whiteboard
- Clock

ICT: [Refer Technical Specification]

- AV display
- equipped for virtual conferencing equipment
- wireless access (Wi-Fi)

2.4.3 Canteen Facilities

FUNCTIONAL AREA:	Primary School Canteen Facilities			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	90	90	100

Overview

The Canteen will be the location where food and drinks are prepared for sale, and where food and drinks are sold for consumption. This will include making meals from raw ingredients, making meals in quantity for distribution, storing packaged foods and drinks ready for sale, and preparing food items for display and counter sale.

The Directorate supports healthy food options that is governed by the ACT Public School Food and Drink Policy.

Functional Units required for a Primary School Canteen:

- Canteen preparation area
- Indoor canteen servery area
- Canteen store
- Staff toilet / change room
- Office work area
- Secure delivery area

Operational factors to consider

The sale of food in ACT Schools is regulated by legislation and policy, including:

- the ACT Public School Food and Drink Policy
- the Food Act 2001 (ACT)
- the Food Regulation ACT 2002 (ACT)

The canteen must be located centrally in the school, facing the central outdoor space, where students can easily access it. The canteen will serve as a communal gathering space for the school.

Generally, the canteen operates with two peak service periods. Students will use the canteen at mid-morning recess and at lunchtime. Generally, canteen staff will work in the Canteen from morning through to early afternoon.

The Canteen will have a service counter opening to an internal service area to provide all weather service for students. The principles of inclusion must inform the design of this space, so that the service counter is accessible to any user.

The service counter must be able to cater to the needs of students of all year levels, including wheelchair accessibility. The servery area must be sized and designed to avoid students crowding. Areas designated for queueing for counter service must not clash with circulation routes to and from building doorways.

Opportunities

The Canteen and the Food Technology specialist area share the need to have food materials delivered and quantities of food waste removed. If it is possible in the context of the distribution of functional areas, co-location or proximity of the canteen and the Food Technology functional areas would be desirable.

Functional Relationships

The canteen location must allow for practical paths for goods deliveries and removal of waste.

The canteen must have an external door (with security flyscreen) for:

- receiving deliveries of packaged foods, packaged drinks and packaged and raw ingredients
- removal of kitchen waste, wheelie bins, etc.

Canteen Facilities – Preparation Area

FUNCTIONAL UNIT:	Preparation Area			
FUNCTIONAL AREA:	Canteen			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	35	35	35

Design Intent

Preparation for food for sale, including servery/sales counter.

Operational factors to consider

Efficient layout and work area to support 2 – 4 persons engaged in the sequential preparation, assembly and cooking of simple meals and food items.

Canteen staff will generally work in the Canteen from morning through to early afternoon.

Schools may arrange to have lunch orders submitted in the morning. The Canteen Preparation Area will need work space to process orders, process cash payments, produce food to fill the specific orders, pack and return class lunch orders ready for collection.

Safe work environment – slip resistant floors, good lighting, ventilation and extraction.

Selection of resilient and hard wearing materials suited to regular and thorough wet wash.

Appliance selection and joinery suited to the requirements of a commercial kitchen/ licensed food preparation premises.

Functional requirements

The Canteen Preparation Area will include:

- worktops
- below bench storage and overhead storage, including general storage with adjustable shelves, and specific storage in drawers and cupboards for utensils, cookware, cutlery and crockery
- Separate washing up areas suited to the requirements of a commercial kitchen
- cooking area
- refrigeration and freezer appliances
- hands free hand wash facilities
- provision of temporary storage and disposal of waste (including provision for sorting waste into recycling categories)

Adequate power outlets must be suitably located and distributed around external walls to suit alternative locations for the placement of appliances. If the design includes an island bench, all necessary services must be reticulated to that location. The location must take account of the built-in worktops cooktops and enable safe connection of appliances.

Network access must be provided - including a phone point and capacity to connect an internet linked cash register or point of sale card reader.

A section of benchtop must be suitable for use as a sit down work area/ work bench for the canteen manager – with phone, data point, power for appliances, whiteboard and pinboard, overhead storage for ring-binder folders, and drawers for storage of stationery and office supplies.

Specific functional requirements**Spatial layout:**

- sufficient space for people to work and circulate
- space for safe and direct transfer of prepared food and drinks between the preparation area and the servery

Fitout (refer to Technical and FF&E Specifications)

- resilient flooring – integral self-coved skirting
- fitted joinery/ commercial grade

- direct access into the canteen without entering school interior spaces
- unobstructed area to receive deliveries and for removal of waste
- space for waste receptacles, bins, etc.
- space for fridges and freezers supplied by food distribution companies

Visibility:

- line of sight to canteen servery counter

Acoustics: (Refer Technical Specification)

- compliance with workplace health and safety regulations – including noise levels at exhaust hoods

Hydraulics: (refer to Technical Specifications)

- H & C Potable water
- chilled and boiling water dispenser
- sinks
- floor waste
- hands free hand wash basin

Electrical:

- adequate power outlets to support appliances and services in fixed locations
- power outlets distributed around walls and above and below benchtops including island benches if included, to support alternative placement of portable cooking appliances

ICT: (refer to Technical Specification)

- telephone point
- Wi-Fi coverage

Security (refer to Technical Specification)

- locking to all doors and shutters
- security for stock
- PIR/ intruder detection – key pad at each entry door to isolate Canteen zone

benchtops (stainless steel or equivalent with splashbacks and storage over and under

- storage space for baskets or containers used to deliver lunch orders out to individual classes/ homegroups
- storage for chemicals, cleaners, and cleaning gear (including mop and buckets)
- clock
- whiteboards and display boards (sufficient area for display of statutory workplace notices, rosters, OH&S notices, etc.)
- fire extinguisher
- fire blanket
- wall mounted first aid cabinet
- servery hatch and counter opening to indoor servery area
- waste bins – sized for the volume of waste generated daily, and multiple bins to suit sorting of waste into recycling categories
- refrigerators and freezers
- oven, cooktop and exhaust hood (domestic standard)
- microwave oven(s)
- dishwasher
- two bowl stainless steel sink, with bowl dimensions sized to take commercial cooking pots, cooking trays and racks from the fitted oven
- Handwashing basin
- soap and hand sanitiser dispensers
- paper towel dispensers

Canteen Facilities – Indoor Servery

FUNCTIONAL UNIT:	Indoor Servery			
FUNCTIONAL AREA:	Canteen			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	30	30	40

Design Intent

Display and sale of food to students. Service and tabled seating area for students.

Operational factors to consider

Access to the Canteen Servery can be intense for short periods of the day. The length of the Servery opening and a spacious forecourt adjacent will facilitate the ease of movement and prevent overcrowding.

Students may use a transaction card for payment or pay with cash.

Travel paths of students must be considered for the canteen servery.

Functional requirements

The location, layout and fitout of the Canteen Servery is required to:

- The Servery must be located as an internal (inside the building) component
- Contain tabled seating for students
- display and present all foods and drinks within easy reach of canteen servery staff
- display a list of food choices with prices
- Provision for waste disposal (green waste, recyclables and land fill)
- The indoor area must be designed to be simply and easily cleaned. Floor and wall surfaces and items of furniture must be easy to clean and maintain
- provide counter space for service to multiple students of varying heights (P-6 students)
- provide security when not in use via a lockable metal roller shutter and lockable doors

Specific functional requirements**Spatial layout:**

- sufficient work and circulation space to permit unencumbered movement between servery counter and dining area
- servery counter to accommodate continuous movement of students

Visibility:

- line of sight to food preparation area
- visibility of wall mounted menu and prices board above servery counter fitout

Acoustics: (Refer Technical Specification)**Electrical:**

- adequate power outlets to support appliances and services in fixed locations

Fitout (refer to Technical and FF&E Specifications)

- resilient flooring – integral self-coved skirting
- wall mounted menu and prices board (whiteboard)
- clock
- waste bins

Security: (refer to Technical Specification)

- locking to all doors and shutters
- PIR/ intruder detection – key pad at external entry door to isolate Canteen zone

ICT: (refer to Technical Specification)

- data point for cash register/ point of sale device

Canteen Facilities – Store

FUNCTIONAL UNIT:	Canteen Store			
FUNCTIONAL AREA:	Canteen			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	15	15	15

Design Intent

Storage of ingredients, raw materials, and dry goods.

Operational factors to consider

Delivered goods will arrive in various forms of packaging and are likely to be delivered on a hand trolley. Some packages will go into storage as is, and some will need to be broken down so that foodstuffs can be transferred to suitable storage (shelving, refrigerator, freezer) on receipt. A stainless steel bench for this purpose would be desirable.

The Canteen Store (walls and floors) must be easily cleaned to comply with regulations.

Consider work flow of food preparation. The most frequently accessed foodstuffs should be easily reached from the point of entry.

Functional requirements

- storage of a wide range of fresh and packaged foods, bulk dry goods, bottles, cans, frozen foods, etc. in conditions that do not lead to contamination, or degradation
- maintainability – easy to clean
- meet manufacturers' storage conditions for packaged food, support extended shelf life for fresh foods
- daylight is not required
- maintenance of even temperature when the premises are not occupied is required

Specific functional requirements**Spatial layout:**

- adjacent to the Canteen food prep area
- convenient path from the external door – for deliveries

Mechanical:

- exhaust ventilation to maintain optimum conditions for storage of fresh foods
- additional ventilation may be required to exhaust heat load from refrigerators and freezers

Fitout (refer to Technical and FF&E Specifications)

- resilient flooring – integral self-coved skirting
- impervious easily cleaned wall surfaces
- adjustable stainless steel racking and shelving along walls
- large refrigerator/freezer

Security:

- lockable door

Canteen Facilities – Staff Toilet and Change Room

FUNCTIONAL UNIT:	Canteen staff toilet and change room			
FUNCTIONAL AREA:	Canteen			
Min Nett Area:	Permanent buildings provided for a Primary School size of:	3P	4P	5P
	m ²	10	10	10

Design Intent

To provide change room and toilet amenities for Canteen staff.

Operational factors to consider

Adjacent to Canteen Perp area.

Functional requirements

- Unisex single toilet space
- Provision of a space for canteen staff to store workwear, get changed and store clothes, shoes, personal effects
- Provide space for display of notices/ work rosters

Specific functional requirements**Spatial layout:**

- integrated staff change room and toilet facility

Acoustics:

- privacy – acoustic insulation to bounding walls

Hydraulics:

- WC - toilet pan and cistern
- hand wash basin inset in benchtop
- Floor waste

Mechanical:

- exhaust ventilation

Fitout: (refer to Technical and FF&E Specifications)

- resilient flooring – integral self-coved skirting
- impervious easily cleaned wall surfaces
- vanity bench with storage cupboard underneath
- mirror
- soap dispenser
- paper towel dispenser or electric hand dryer
- waste bin
- toilet paper holder
- sanitary bin
- clothes lockers (minimum of 4)
- bench seat
- pinboard for notices
- coat hooks

Security:

- solid core door with privacy latch

2.4.4 Primary School External Learning and Playground Areas

FUNCTIONAL AREA:	External Learning and Playground Areas		
Min Nett Area:	Distributed across the school site		
	See table below		

Design Intent

Learning within the Primary curriculum requires the support of external spaces. These learning spaces must also be designed to support learning through outdoor play and promote a healthy lifestyle through exercise. The external spaces must be activated with services, pavements, shelter, and landscaping elements that support a range of learning activities applicable to the learning context.

The Primary School external playground areas also require careful design that supports the function of the school.

Functional Units

	3P	4P	5P
External Learning Settings for Specialist Areas:			
Pre-School Fenced Play Area	1 (750 m ²)	1 (1,000 m ²)	1 (1,000 m ²)
Small Group Program – Sensory courtyard	4	4	4
Hard Courts (must include “run-off” space):			
Netball/Basketball	2	2	2
Futsal	1	1	1
Bike storage – students and staff	Refer Section 1.7.10	Refer section 1.7.10	Refer section 1.7.10
Parking	Refer Section 1.7.11	Refer Section 1.7.11	Refer section 1.7.11
Sports field	1 Rugby/Soccer	1 Rugby/Soccer	1 Rugby/Soccer
Passive playground areas with seating	600 m ² (1 m ² /std)	800 m ² (1 m ² /std)	1,000 m ² (1 m ² /std)
Shaded spaces (with seating) within Passive area	For 200 students	For 300 students	For 400 students
Active open informal games area(s) [additional to hard courts and sports fields]	Site Dependent	Site Dependent	Site Dependent
Gathering and performance space(s)	1	1	1

Functional Relationships

External Learning Environments are required for:

- Wet, messy activities or large scale construction and creative projects adjoining indoor STEAM areas
- Connection to the Health and Physical Education Gymnasium to sports field and Hardcourts
- small to large group discussions, performances and presentations
- provide opportunities for students to exercise choice and explore boundaries safely
- provide spaces that extend the internal Learning Settings beyond the building walls
- provide spaces for imaginative and free form play
- provide exposure to natural materials and natural processes
- enable discovery in nature with natural materials
- enrich the sensory environment
- support gross motor development
- present physical challenges and encourage learners to stretch themselves
- support environmental, sustainability and Science, Technology and Maths education

- inspire creative works – Art, Performing Art or writing
- provide social, recreational space
- provide spaces for small scale and large scale outdoor performances – impromptu and planned

Opportunities

All external areas provide an opportunity for enriching learning. The designs for External Learning Settings should consider how the use of external environments can contribute to the learning outcomes for relevant Curriculum Learning Areas. For example:

- How can concepts such as scale and measurement be incorporated?
- How can the understanding of Culture, Geography, or Climate, or Biology, or Food Technology be enhanced by outdoor learning activities?
- How can outdoor spaces be utilised for larger, more challenging projects in design or technology?
- How can designed outdoor spaces enhance the engagement between Music and Drama performers and their audience?
- How can outdoor spaces inspire creative works in Art or writing?

External spaces where students may gather socially or for a purpose (music performance, sporting games) will be enhanced by built elements such as stage platforms, seating, shade structures and amphitheatres. External Spaces will be enhanced by open paved areas, shelter from sun and prevailing winds, benches, and wide doorways connecting the interior and exterior – facilitating the transfer of tables and chairs, the transfer of project materials or manufactured elements of a project out to an assembly area, and the transfer of finished creative work back into the adjacent learning Functional Area.

Operational factors to consider

External spaces intended to support the learning of a specific learning must be directly connected to internal learning Space e.g. the Art Courtyard must have a door connecting it to an Art room.

The Primary School playground must be carefully designed with:

- Zoned Active and Passive areas
- Designated travel between areas
- Clear lines of sight for supervision

Some External Learning environments will be designed with a focus on supporting learners with additional needs. These spaces must be responsive to a wide range of student needs.

Functional requirements

The Playground area layout and fitout must include:

- Paved areas outside direct travel paths that are line marked or that can be line marked for group games such as handball
- Specialised Play equipment refer to *EDIS Part D – Technical Specifications*
- Other physical challenges and opportunities to practise and develop gross motor skills
- Nature play spaces – refer to *EDIS Part D – Technical Specifications*
- Adequate seating and shade components in passive areas – see table above

The location, layout and fitout of all playground areas must be:

- A comfortable microclimate including shade, shelter, and protection from prevailing winds
- A safe, secure area
- Be inclusive of all students
- Designed to foster friendship groups, positive social engagement and communication

Specific functional requirements**Spatial layout:**

- include areas described above

Visibility:

- line of sight for playground supervision

ICT:

- Wireless data coverage

Fitout:

- a range of play equipment and play spaces to suit the age range
- level hard-wearing pavements suitable for fixed and mobile furniture
- pavement materials that can be repeatedly cleaned without degradation of the pavement surface
- pavement materials that are designed to reduce sun glare
- level changes and planting to define area and to provide fixed seating and performance opportunities
- vegetation of varying scales to create interest, to provide natural shade, to screen against prevailing winds, and to provide seasonal variety
- provide shade structures and protection from prevailing winds
- cold water bottle refilling stations
- hose cock and power outlet

3 Appendices

3.4 Education Facilities Design Principles

Education Facilities Design Principles
Create contemporary learning environments that facilitate the personalisation of learning through: • designing integrated learning settings that support and enhance a full range of learning and teaching activities for a range of group sizes from individual, to one to one, to small collaborative groups and larger group learning • support disciplinary and interdisciplinary learning within and between the Australian Curriculum learning areas for each stage of learning • ensure age appropriate fit out of spaces for learning, recreation and socialisation • provide seamless access to learning by ensuring virtual connectivity locally, nationally and globally • ensure ease of access to learning and teaching resources at the point of use through distribution of appropriate storage throughout learning spaces • activate, invigorate and enrich learning spaces - indoor and outdoor • ensure all areas of the school site are assets for learning and maximise the use of the outdoor environment as an integrated component of the total learning environment paying particular attention to sustainability education
Support a sense of community and belonging both within the school and the school within the wider community. Design facilities that: • are welcoming and promote inclusion of the community, including Australian Indigenous and culturally and linguistically diverse members • actively promote community access and engagement • support 21st Century learning as the basic organisational structure • involve the sharing of resources and learning spaces • inspire participation in, and responsibility for the learner's community and respect for others and property • provide Facilities that can be shared by the community to host a diversity of purposes, including for building a community culture • respond to the local context and assist in creating a local context for new communities • promote integration over segregation including integration of re-locatable buildings through innovative design and effective master planning
Support collaborative learning and teaching for professionals by: • making provision for meeting spaces for professional collaboration and planning in small, medium and large groups • enabling teacher modelling, mentoring and peer observation by ensuring teaching is visible and can be observed unobtrusively <i>in situ</i> • designing learning spaces for seamless flow of students and teachers between integrated learning settings and spaces • the deliberate layout of the learning settings to provide for seamless access to and from • required resources and ease of flow between spaces • the juxtaposition of spaces ensuring continuity and appropriate merging of atmosphere and acoustic requirements • providing fit out of the learning settings that is appropriate to the curriculum focus and specific learning activities for which the setting is designed

Education Facilities Design Principles

- Promote and support enhanced inclusion, access and choice for all learners by
- provide signage, display areas, meeting and gathering spaces to honour and celebrate cultural diversity and contribute to the development of intercultural understanding
- promote and support enhanced inclusion of learners with special learning needs
- go beyond minimum compliance and employ universal design principles (design for all) that aim to make the built environment more usable by more people – equitable access, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, size and space for approach and use
- provide choice in learning settings

Design facilities that are aesthetically pleasing, welcoming and support the physical, emotional and social wellbeing of the students and staff by:

- providing a welcoming entry to all facilities
- providing indoor conditions and amenity that support and enhance learning
- promoting delight and inspiration among students and the broader school community
- educating the aesthetic imagination and the senses
- including informal social spaces and hubs and thus opportunities for students to further develop personal and social capability
- providing a continuum of learning and recreation
- actively promoting the safety and security of all students, staff and visitors and minimise security risks for buildings and other school assets
- ensuring students and staff are provided thermally comfortable indoor learning spaces to maximise wellbeing and learning, health and performance.
- integrating facilities with the natural and urban environment
- actively promoting safe and easy access by all modes of transport and encourage students and staff to travel by sustainable modes of transport wherever possible

3.5 Australian Curriculum Overview K-10

Learning Areas and Subjects	Year levels	General Capabilities important for life and work in the 21st century	Cross Curriculum Priorities
The Arts: Music Visual Arts Dance Drama Media Arts	K–10	Integrated across all Learning Areas and all Year levels Literacy Numeracy ICT Capability Critical and Creative Thinking Personal and Social Capability Ethical Behaviour Intercultural Understanding	Integrated across all Learning Areas and all Year levels Aboriginal and Torres Strait Islander histories and cultures Asia and Australia's engagement with Asia Sustainability
English	K–10		
Mathematics	K–10		
Health and Physical Education	K–10		
Humanities and Social Sciences:			
History	K–10		
Geography	K–10		
Civics and Citizenship	Yrs. 3–10		
Economics and Business	Yrs. 5–10		
Languages	K–10		
Science	K–10		
Technologies:			
Design and Technologies	K–10		
Digital Technologies			
Work Studies (optional)	Yrs. 9–10		

3.6 Outdoor Sensory Space

The Outdoor Sensory Space will be accessed through the adjacent SGP, to provide both sensory experiences to support de-escalation of stress and an outdoor learning space. The students in the SGP may have a range of mobility limitations, and the design of the outdoor space must support access and use by any students in the SGP.

It is essential that the students using the SGP spaces are not 'on-show' to the school, therefore the Outdoor Sensory Space location must be carefully considered. Location requirements:

- sheltered and removed from the noise and activity of the larger school grounds such as sports courts, canteens, outdoor performance stages
- free of extraneous noise and distractions, and located away from areas of high activity such as roads or incompatible adjacent uses
- placed within a defined and safe space with direct access from the SGP that it serves
- Where the space is not bounded by building walls, the boundary should provide a degree of screening and privacy from adjacent external areas
- Where the limits of the space are not defined by building external walls, the boundary is to provide privacy for students and to discourage students from climbing the privacy screen
- Obvious barriers such as fencing should be avoided
- Palisade screens are preferred
- There must not be any windows in external bounding walls that permit students in other spaces to look into the space
- Outside the space, pedestrian footpaths must be kept removed from the courtyard boundary (at least 20m)

The Outdoor Sensory space must incorporate:

- Planting, shade, shelter, circulation routes, areas for activity and quiet reflection, and sensory experiences (touch, smell, hearing and sight). Where planting is incorporated - it must not facilitate students climbing the screen
- Partially fully-roofed area providing all-weather outdoor space plus pergola/ sunshade/ shade sail to enable students to utilise most of the space (25m² total) in all weather conditions. Fixed structure to include roof anchor points for attachment of swing/s ropes (swing load to be suitable for large adolescent student)
- A variety of surfaces at the ground plane including synthetic grass with shockpad/ softfall underneath, a circle of rubberised softfall or synthetic impact absorbing surface below and around swings, and concrete paving below the roofed area and describing a sensory pathway route
- Seating opportunities in both shaded and non-shaded areas, noting that seating points must be located to not assist climbing onto boundary screens or shade structures
- Landscape planting to provide students the opportunity to interact and engage with the planting and setting by:
 - seeing, touching, and smelling the planting
 - listening to wind, water, birds, and insects
 - watching the passage of sunlight over planting and through sunshades and leaf canopies
- Space provided for loose FF&E which may include a stationary bicycle, water tables, work tables, etc.)



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Part C: Master Planning and Architecture Specification



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Organisation
Education Directorate's Infrastructure Specification (EDIS)
Introduction
Part A – Project Specific Requirements
Part B – Functional Brief
Part C – Masterplanning and Architectural Specification
Part D – Technical Specification
Part E – Furniture, Fittings and Equipment Specification
Part F – Facilities Management (Services) Specification (if required)
Part G – Documentation Deliverables

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1. Urban Design

1.1. Schools and the Public Environment

Urban design concerns the arrangement, function and quality of cities, towns, smaller urban settlements and local community in their entirety. While, it involves creating the right conditions to make places work, its focus is on the public environment – an essential component of urban life comprising all those parts of a city or town that are open, available and inviting to free public use (regardless of ownership).

A mix of public and private spaces supports our social needs, with the public environment playing a fundamental role in linking the disparate parts of a place and the social fabric of a community. In a sense, the public environment provides the physical framework and the social territory that supports cohesive and supporting communities.

Schools are one of the few types of public building still being built in new and growing communities. They provide community focus and engagement, community facilities and contribute to the urban structure, legibility, coherence and pride of place. Schools are pivotal to the social, cultural, economic and environmental well-being of communities. It takes a community to raise a child successfully.

Good urban design integrates schools with surrounding communities through careful consideration of site planning, building form and scale; the location of access routes (vehicle, bicycle and pedestrian) and surrounding infrastructure; and by considering the co-location of related uses and activities (e.g.: sporting facilities, play equipment).

Schools, at their best, function as the centre of the community and offer the opportunity to share facilities. Many schools and communities work together to share library facilities, sporting facilities, meeting spaces, performance spaces, holiday programs, co-location with child care/ early learning centres and before and after-school programs on school grounds. Through good urban design close links between a school and its community can enhance student learning, public safety, health and economic wellbeing and encourage sociability in culturally diverse and disadvantaged areas. A strong relationship between a community and the school will result in the community advocating for the needs of the school and the students, supporting fund raising activities, volunteering for school related activities and providing a passive security service.

In addition to space, time is a vital element in urban design, defining it as a process not a product. It should be considered in its three states – past (origins and early development), present (current condition) and future (informed, evidence-based speculation on future development and the place of a dynamically evolving school in it).

1.2. ACT Planning Strategy

The ACT Planning Strategy (2018) sets out five related themes: compact and efficient; diverse; sustainable and resilient; liveable and accessible. The strategy can be found at:

<https://www.planning.act.gov.au/act-planning-strategy>

The Contractor must consider this strategy and develop a Master Plan for the School that implements it in the design response.

2. Master Planning

2.1. Urban Context Analysis

A necessary precursor to a strongly grounded urban design proposition is a rigorous, in-depth analysis of the Site and its embedded urban fabric. The master plan for the Site must be based on an understanding of the nature of a place and must therefore be underpinned by a comprehensive analysis of the natural, cultural and built context.

The urban design analysis must take into account:

- key elements of the existing and future proposed context and the nature of the surroundings beyond the Site, including connections to the broader natural systems
- existing and future connections between the Site and surroundings and the patterns of movement of pedestrians, cyclists, and vehicles
- cultural links to the site (e.g.: Aboriginal and Torres Strait Islander people; early settlers; migrant communities)
- the existing patterns of built form on the Site and around it, including heritage elements existing flora and fauna on and adjoining the Site, and characteristics that make it a unique place
- the Site topography, historical land use (considering ground condition and contamination risks), hard and soft landscape (living infrastructure) and ecology

Further information on the Site is located in *EDIS Part A - Project Specific Requirements*. This information may include background information on demographics, growth statistics, history and culture and strategic objectives for the Project Site – all of which inform the urban context analysis, vision setting and master planning process of the Site. The master planning must promote the development of integrated community precincts that encourage links between adjacent facilities and maximise accessibility for parents/ carers, students and other community members.

2.2. Cultural Integrity

The Directorate's commitment to the principle of "Cultural Integrity" requires the design to consider and incorporate the tangible and intangible aspects of the body of indigenous cultural practices, resources and knowledge systems, including living landscapes, song lines, spiritual connection and traditional associations. Culturally aware design understands the deep importance of indigenous cultural heritage as a 'living culture' and respects a building's placement on Ngunnawal Country. This principle should be reflected in all aspects of the design of the Facilities.

To fulfill this commitment the master plan must include:

1. A guided site tour engaged through the United Ngunnawal Elders Council
2. A demonstrated understanding of the Principles of engagement, and a commitment to engage, in accordance with the "Protocols for working with Aboriginal and/or Torres Strait Islander peoples (September 2015)", produced by the ACT Aboriginal and Torres Strait Islander Elected Body.

2.3. Allowing for Enrolment Growth and Future development

Information on the Long Term Enrolment (LTE) and projected Peak Student Enrolment (PSE) for the School is detailed in *EDIS Part A - Project Specific Requirements*.

The master plan must consider planning for Peak Enrolment and provide the options for the expansion on the site. Consideration must be given to the alignment with the proposed buildings, landscape elements (hard and soft), service connections and for integration with community use facilities.

2.4. Integration of Early Education and Care Centres and Community facilities

The Master Plan for a Primary School must identify nearby Early Education and Care Centres (existing or planned) and community sporting or recreational facilities (existing or planned) and demonstrate ways that the School planning is integrated with and engages with the facilities and their community of users. The shared use of car parks should also be considered.

Refer to *EDIS Part B – Functional Brief, Section 1* for community use of facilities.

2.5. A Sense of Address

The School should invite and welcome the local community through the design and orientation of buildings and through the creation of an obvious point of entry and address. Where community facilities such as early childhood services and open space are located adjacent to the school Site, master planning should, where possible, have reference to the location and design of these facilities so as to create a community precinct that encourages links and interaction between schools and community facilities, maximises ease of use for parents and other community members, and zones the School in to public access and secure school zones.

2.6. Movement Networks

Master planning, particularly the location of entry points and car parks, should have reference to the surrounding footpaths, pedestrian crossings, bicycle paths, busbays, street network and its traffic management infrastructure.

Refer to *Section 4*.

Where pedestrian / bicycle paths abut or run close to a Site, safe and easy access to the Site must be provided. It is critical that access for students arriving by non-motorised forms of transport is encouraged and carefully considered as part of the master planning process.

The traffic flow design must ensure safe vehicular, bicycle and pedestrian access into, out of and around the school and ensure minimal disruption to surrounding traffic movement. The orientation of the School and its entry points should have reference to surrounding drop off and pick up areas to maximise accessibility and encourage safe movement of parents, students and other users of the School.

The master plan must consider and resolve the space provided for the arrival, parking, loading and unloading of buses, with the design capable of accommodating several buses at any time. Associated with this function, the master plan design and the constructed facility must make provision for the safe and convenient circulation of large numbers of students arriving or departing by bus, including provision of paved sheltered waiting areas (with seating) on the school site and proximate to the bus parking areas.

2.7. Summary of Key Considerations

The master planning and Site planning design must give consideration to and resolve the competing demands of the following key issues:

- the School's place within the immediate neighbourhood and wider community and its connection to Ngunnawal land
- patterns of movement to and through the School
- nearby community facilities. Potential linkages and partnership arrangements with other Directorates of the Territory (e.g.: Sport and Recreation Services) and/or local community groups
- exploiting the full extent of land when planning the Site. Every part of the Site should be highly considered and integrated. Residual elements should be avoided
- Integrated external areas of the school as described in *EDIS Part B – Functional Brief*

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- the natural assets of the Site. These assets (including existing ecosystems, topography, vistas and habitats), can inform the design response but also become part of the learning experience
 - a clear address and main point of entry for access to all Facilities. A school entry should be conspicuous and announce itself to the neighbourhood. The School's address is more than just a 'drop off point', it is the interface between the school and students, parents and the community
 - encouraging active transport through the design. The Site must integrate with the area's broader cycling and walking path networks
 - future positioning and location for expansion for projected Peak Student Enrolment
 - clarity around after-hours use and access for the public, parents and students to the Facilities. The way these areas will be expressed in the built form, co-location and access
 - the impact of after-hours use on Site security
 - gathering spaces at pick-up times are important social places for parents
 - congestion created by school pick up/drop off by car or by bus. Position parent car pick up/drop off safely, separate from the main pedestrian entry and consider how it can be managed through design. Encouraging active transport will help reduce potential congestion

3. Architectural Design

Good design plays an essential role in enabling high-quality education environments that support the learning needs and wellbeing of every student and as a workplace for staff. An enduring legacy of any government is the quality of school buildings that it delivers and the school's ability to support the diverse learning and wellbeing programs delivered to students and the community into the future.

The ACT is committed to developing and delivering high quality, innovative, sustainable and value-for-money school infrastructure assets. High quality design has an important part to play in achieving this objective. High quality design is functional, durable and sustainable, but it is also comfortable, stimulating, uplifting and inspiring.

It is important to remember that:

- generally, every young person in Australia will attend a school for 13 years (K to yr. 12)
- during those years, outside of home, children spend most of their time at school
- teachers and the school environment will leave an impression on every student for the rest of their life
- the learning and wellbeing that a school provides for each student will be the greatest influence (outside of their home) on their life in terms of personal success
- connections between the built environment and the natural environment support the health and wellbeing of students and staff
- embedding ecologically sustainable design principles into our schools demonstrates our commitment to a sustainable, zero emission future for our young people

It is therefore critical that the design of a new school supports the learning and wellbeing programs that will be delivered, that teachers and staff have a professional workplace and that it encourages the community to engage with the school.

The Contractor must provide a school design that will inspire all who use it day-to-day and will make a positive statement to the community.

There is strong evidence that the quality of a school building and the open space around it can have a profoundly positive impact on student concentration, pride, attendance, engagement, behaviour and educational outcomes. While learning is reliant upon effective teachers and motivated students, increasing evidence¹ demonstrates that students' learning outcomes are related to the quality of learning spaces and building performance. Aspects of design and environmental conditions that impact on learning include noise, temperature, seasonal variation, natural landscape, humidity, air quality, ventilation, air flow, thermal comfort, building age, quality and aesthetics, natural and artificial lighting, access to technology, school size and class size.

Spaces that support students learning are vital to the success of contemporary learning. In addition, a well-designed school supports professional collaboration and provides a better workplace environment for teachers by contributing to recruitment, professionalism, staff productivity, staff expectations, retention, morale and reduced absenteeism.

Design quality is recognised internationally as strongly influencing student attainment via teacher motivation and morale, student motivation, and time-on-task in purpose built facilities.

The Contractor must deliver an innovative design taking into consideration the whole of life costs of the assets, whilst paying attention to the individuality and specific qualities of the Site and surrounding community.

A well-designed school must create value for money external environments, buildings and internal spaces that:

¹ Barrett, P, Davies, F, Zhang, Y., Barrett, L. 2015 Building and the Environment, *The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis* <http://dx.doi.org/10.1016/j.buildenv.2015.02.013>

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- reflect the ACT's vision for learning and Education Facilities Design Principles as outlined in *EDIS – Introduction*
 - are fit for purpose
 - are safe and secure
 - reflect the design intent and functional requirements specified in *EDIS Part B – Functional Brief*
 - are Site responsive to the setting, the urban structure and identity of a place
 - are environmentally, economically and socially sustainable
 - are resilient to a changing climate (both built and living infrastructure) including extreme temperatures and weather events
 - are engaging, diverse and inclusive
 - are culturally rich
 - reflect the technologies of their age in ways that promote sustainability and support information rich connected learning

The School will be an important public building for the local community and hence should avoid presenting as institutional in form or character. The School must be designed to have status in the neighbourhood and set the urban structure and identity of a place. Good design should signal the School's civic qualities and value within the community. A School's status as a place of education should be prioritised rather than diminished. The architecture must define a strong presence while at the same time project a sense of safety and welcome.

The Contractor must consider the presentation of the buildings and landscape to each boundary and street. These edges will be the 'face' of the Facilities to the community.

As well as addressing the essential functional requirements, the School design must give attention to the detail and the context of the Site. The design of Facilities must:

- promote a sense of connection for all those who use the Facilities
- deliver school environments where students want to be and where they are inspired to create and learn
- incorporate external learning environments that are easily accessible to provide enriched settings for learning and to assist with meeting individual and social needs of students
- emphasise the spatial quality and distinctiveness of each building and each component part
- present as Community Facilities in form and character
- ensure spaces are planned as appropriate to their use (as specified in *EDIS Part B – Functional Brief*)
- provide circulation that is efficient and where appropriate, be adaptable to accommodate other uses such as collaborative learning spaces, breakout areas, display or lockers
- ensure the layout enhances the operational efficiency of the school. The design must consider how this can be best achieved through the use of orientation, space use zoning, form, materials, mechanical systems and architectural expression
- orient each school building to take full advantage of the Site
- engage with the natural and constructed landscape through views between interior and exterior spaces
- optimise the integration of Ecologically Sustainable Design (ESD) principles

3.1. Innovation

The Contractor is to deliver innovative designs of learning and teaching spaces – in line with the best practice outline in *EDIS – Introduction* and described in *EDIS Part B – Functional Brief*.

Innovation must consider the different ways to achieve functional requirements and design principles. Alternate design strategies will be considered against all design criteria.

The design of new inspiring schools will require an ability to adapt to educational and technological change. This is the principle of Responsive Design outlined in the *EDIS – Introduction*.

3.2. Universal Design

Universal design recognizes that there is a wide spectrum of human abilities, including physical, perceptual, or social and cognitive abilities as well as there being different ages, gender recognition, body sizes and shapes. Learning environments must be designed to provide good anthropometrics for all students and teachers using universal design principles as set out in the *EDIS – Introduction*.

The Contractor must create a holistic design approach that enables the degree of integration that is appropriate to each person's needs. The Contractor must eliminate any barriers to inclusion, and design Facilities that are equally accessible in the internal learning Settings, in external learning environments, and play areas.

3.3. Building Quality, Materials and Lifecycle

The architectural design must take account of the performance characteristics and durability of all the materials and components used in each building structure to ensure that the design life of the structure is achieved and that maintenance requirements are minimised. Materials should be considered which contribute to the diversity in experience of the users, with due regard for scale, colour and texture.

3.4. Design and Construction to support future change – Responsive Design

The use, size or requirement of some functional areas may be subject to change over the life of the School. The School design and construction system and the layout of fixed services must support opportunities for future change and re-configuration of general educational and administrative spaces. Designing Facilities that can be responsive to changes in both pedagogical and spatial design practices is a requirement of the masterplanning. I.e. buildings that can be easily changed with at minimum cost and disruption e.g. the minimum use of load bearing walls.

Where possible, the School should be designed as serviced core spaces and more adaptable surrounding spaces. The building structure must provide large clear span zones, with functional spaces in those zones defined using partition walls that can be removed and reconfigured at a later date. Fixed joinery and hydraulic services should be kept away from walls that divide similar adaptable spaces, and away from external walls (if that is the proposed direction of future expansion).

3.4.1 Educational and Architectural Design and Operations Guide

An Educational and Architectural Design and Operations Guide for use by the school is to be submitted in conjunction with the final Architectural design drawings but should be progressively developed through the Detailed Design stage.

The purpose of the guide is to provide a resource that school leaders and staff can refer to for guidance on the intended function and use of the learning spaces, amenities and equipment for general use. The design guide ensures that the school gains maximum advantage from the designs and are alerted to the potential uses of the learning spaces. This will minimise 'design slippage' between the design intent and end use.

The guide shall include the following items for each Functional Area:

- A statement of the broad design intent of the area and its desirable relationship to other functional areas when it is intended that the functions should be integrated or interconnected
- Link design elements and features to specific Education Facilities Design Principles
- Provide drawings/images that show how the area can be adapted or re-configured for different school organisational models, including furniture

The guide shall explain the Design Intent for each Functional Unit, including explaining or providing:

- What type of learning activities are supported for what group sizes?
- Drawings/images showing spatial and furniture layout options
- Instructions for use for any novel equipment or furniture e.g. energy management data displays etc.

The preferred submission format for the guide is both digital and hard copy as follows:

- digital format editable format and PDF for submitted version
- the digital format must be able to be added to using the same templates if the school develops additional uses for spaces and wishes to include them in the resource

3.5. Ecologically Sustainable Design (ESD)

The Contractor must incorporate ESD principles into the design, construction and operation of the Facilities. ESD elements must be integrated into design solutions, providing multiple benefits and working in harmony with the overall design. The ESD Principles are:

- Integrated Design – collaborative design methodologies that integrate architectural and engineering designs to achieve functional design requirements while minimising resource use. For example, the integration of passive and active strategies to achieve maximum thermal comfort and indoor environmental quality while minimising electricity demand and use.
- Building Life Cycle Costs - procurement decisions are to optimise the balance between capital and operational costs to ensure whole of life best value for money outcomes. Operational efficiency in terms of energy and water use efficiency, capture and storage are to be understood and integrated into whole of life cost analysis.
- Circular Economy - material selection should reference product lifecycle including the sustainability of material production and content (for example recycled content, Australian sourced or manufactured product, etc.), product longevity and durability and end of life recyclability. The collection and safety of the transfer of waste and recycling streams to external facilities forms part of circular economy considerations.
- Material Safety - material and product selection should maximise indoor environment quality and avoid products with harmful chemicals. Materials and products are not to include any chemical on the on the Product and Material Red List.
- Climate Resilience – building design is to consider the risks presented by the likely increase in extreme temperatures and weather events such as fires, drought and storm events resulting from Climate Change. Considerations include but are not limited to, passive design, air tightness/fresh air modulation, insulation and stormwater capacity.
- Landscape Climate Resilience and Adaptation – landscape design is to consider the risks of a changing climate and opportunities for the landscape and external environments to contribute to the safety, liveability, amenity, and resilience of the whole site. Resilient landscape will integrate water sensitive urban design, natural canopy cover and permeability targets, and plant species selection to create landscapes that provide coolth and minimise urban heat generation.

Three primary benefits must be realised from investment in ESD strategies in design and building performance:

- whole of life performance for the Facilities - economic, social and environmental impacts and opportunities
- quality of the learning environment – both inspiration and function for learning
- breadth of the learning experience – enhance and broaden the learning for students e.g. management of ESD active systems such as water, waste or electrical systems

3.5.1 Design Strategies to support Energy Efficient Building Performance

The Contractor must consider the following strategies to reduce electrical power consumption for heating and cooling:

- orientation of building blocks, with their longer axis set out in an east / west direction
- minimisation of areas of east-facing and west-facing glass
- external shading of east-facing, west-facing and north-facing windows. Shading can consist of fixed or operable shade structures or living infrastructure features, for example external tree planting or vegetated pergolas
- insulation of roof (both reflective and bulk insulation), walls, floors (if timber) and around footings and edge beams (if the floor is concrete). Insulation must be made from a material that has a zero Ozone Depletion Factor (ODF)
- ability to introduce natural ventilation via operable windows (either manually or automated via temperature or CO₂ sensors connected to the building management system)
- minimal leakage of air from the buildings
- use of air-locks to external doors
- installation of a photo voltaic power generation system (maximum 100kW unless approved by the Territory)
- high energy efficient whitegoods and appliances
- double glazing to external windows and external glazed doors
- airtight seals and door closers to all external doors
- zoning of areas so that the heated / cooled areas are grouped and isolated from non-cooled areas by means of doors. Heated areas must be separated from the outside by airlocks. Zoning should allow separate operation of spaces identified for after hours or community use outside of school use

3.6. Internal Learning Spaces

All learning spaces must be designed to inspire students and promote learning in line with the best practice outline in *EDIS – Introduction* and described in *EDIS Part B – Functional Brief*.

Learning environments should create physical and emotional health and well-being and promote positive social interaction between all students and staff.

Architecturally the interiors must offer the following:

3.6.1 Spatial Structure

The interior must ensure the overall circulation strategy is clear, simple, safe and legible. It must provide shared circulation spaces, which encourage interaction and use visual transparency to enhance vertical and horizontal connectivity.

The school facility, as a whole, should include building forms and structures that are consolidated rather than fragmented – to provide improved user interaction and flexibility as well as more efficient architectural and engineering design outcomes. Multiple separate building forms and structures connected by extensive external walkways are not preferred.

3.6.2 Circulation vs Terminal Spaces

Circulation spaces provide users with access to functional spaces, which can be considered as destinations or terminal spaces. However, circulation spaces can also be programmable areas, designed to support learning areas and contain functions and activities such as breakout areas for collaborative learning or lockers and wet areas. They can also extend a formal learning space and be integral to connecting several learning spaces into a larger one. A clear hierarchy between circulation and terminal spaces is important for effective place making. The Contractor must provide clear unimpeded access in circulation spaces.

3.6.3 Connections / Relationships between Spaces

The connections between the learning spaces must be supported by the framing of external views, visual 'axes' through the buildings and the use of natural light. The interior design must support the overarching circulation principles with the co-location of similar functions in the same or adjacent zones to capture efficiencies in services.

The design must generally enable line of sight vision of activity in a learning setting from at least one adjacent area for passive supervision.

3.6.4 Natural light, Views and Artificial light

Internal environments within the Facilities must be designed to maximise daylight and views, with the appropriate levels of sun and glare control. Daylight must be able to be modified to suit different modes of use. Natural light and access to views that connect the interiors to the surrounding context must be exploited in the design of internal spaces. Natural light must support the internal amenity, including the main entry areas and links, and must be used as a medium for cognitive way finding.

Artificial lighting must enhance the overall ambience, avoid an institutional feel and provide a secure environment. An appropriate balance of direct and indirect lighting should be used to minimise glare and allow for the prominent display of artwork on walls.

3.6.5 Surface, Colour and Texture

The considered use of surface, colour and texture will enhance and define the spatial structure and support the function of spaces.

A change in texture and surface can help define interior spaces and assist in wayfinding. This approach can be achieved through the use of natural materials. The use of materials is encouraged and will assist in creating an environment that promotes wellbeing and can assist in the management of student behaviour. The materials palette must be developed as part of the integrated architectural and interior design concept and resolution.

The appropriate choice of colour in learning areas must help students and teachers to stay focused, and extend students' attention spans, reduce eyestrain and foster work productivity and accuracy.

The design of colour schemes must:

- support the function of the building and the tasks that are carried out in it
- be restrained
- incorporate natural materials
- complement the display of student work

- create positive emotional and physiological effects
- create legibility and differentiate space

The Contractor must avoid complex colour schemes and the use of contrasting colours of the same value (e.g. red/green), that could create a difficulty for the visually impaired user. The Contractor must consider the widely held view that muted colours and colours of particular hues can have a calming effect on children on the Autism spectrum.

3.7. Furniture

The design, colour, material, flexibility, function, and quality of furniture are all important factors in achieving the functional requirements set out in the Functional Brief and listed in the FF&E Specification. The Contractor's architectural team must collaborate with the School's Principal (both new and existing schools) for the appropriate selection of furniture to ensure fit out achieves the desired intent for each functional area and setting (outlined in *EDIS Part B – Functional Brief*) and the vision for the school.

3.8. Security and Safety

The School must be designed to be welcoming, safe and stimulating environments to complement their role to nurture students, support staff and foster local community identity. However, the School will also be exposed to real world risks and challenges. The School will hold valuable assets and may stand empty for extended periods. When the School is in use, students and adults will be accessing and using the Facilities through the day, evenings and weekends. The design must demonstrate that crime risks and user safety have been considered and addressed. The Contractor must demonstrate that the "Crime Prevention Through Environmental Design" (CPTED) principles have informed the design. The Contractor is also referred to the relevant sections of the ACT Crime Prevention and Urban Design Resource Manual, insofar as they relate to the development of an institutional campus in a neighbourhood context.

Facilities must provide safe and secure environments. To achieve this, the design of the School must:

- provide clear and logical street access to administration facilities that permits the supervision of all entries
- discourage wilful damage
- provide safe areas for groups of children to gather, while avoiding placing external doors in locations that are difficult to monitor
- where possible, compartmentalise Facilities to support a range of out of hours uses
- limit opportunities for unauthorised roof access. The design must avoid external structures and works of less than 1800mm height (such as fences, balustrades, equipment cages, screen walls, shade structures, retaining walls, covered walkways and the like) that present climbing opportunities on to the roof area
- consider on-Site traffic management and separation of vehicular and pedestrian traffic
- include well placed external public address speakers
- provide easy and open access to first aid locations
- utilise durable and strong fencing systems that present a substantial barrier to unauthorised entry onto the school grounds
- utilise security systems, lighting and construction to deter unauthorised access to car parking areas and buildings
- promote good supervision of all internal and external areas by minimum numbers of staff (long lines of sight)
- promote neighbourhood passive surveillance out-of-hours across the site; provide clear and logical external signposting

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- ensure safe and easy access to and from car parking areas at all hours
 - ensure that the carpark area and footpaths used after hours are free from hidden spots (shrubs, substations, etc.)
 - provide safe access to toilets at all times
 - provide security lighting to building perimeters, car park and external paths of access

3.9. Storage

Refer to *EDIS Part B – Functional Brief* for storage requirements.

3.10. Signage and Wayfinding

Schools have an annual intake of new students who engage with a complex and unfamiliar environment. The transition can be made easier by having the design of buildings and external environments support clear and easy wayfinding. Key issues to be considered and demonstrated in the design of buildings and external environments include:

- clearly define points of entry into buildings, and circulation realms through buildings
- define different buildings by materials selections, colour coding, graphics, etc.
- define functions and destinations (canteen, toilets, general office, etc.) by materials selections, colour coding, graphics, etc.
- creating clear and direct pathways that are informed by human factors analysis
- using sight lines to show destinations
- using signs (text/ graphics/ colour coding) at decision points

Associated with the design of internal and external environments, the Contractor must develop a complete signage design that will be installed throughout the School and across the site that provides clear directions, instructions or advice for all Users, that clearly identifies destinations, functions and key spaces, and that is fully integrated into the design of the buildings and external environments. The design of the built and natural environments should support the signage through pedestrian layout, use of colour and material referencing.

4. Traffic and Pedestrian Movement

4.1. General Circulation and Spatial Organisation

Pedestrian links, bicycle paths into the Site, bicycle parking/storage, and pathways/links to public transport and local drop off points must be given a higher priority over other modes of transport and integrated into the School design as a whole.

The main access to the School must be prominent and easy to find, with the School buildings located near to it and clearly visible from the road. Additional points of access must be provided around the Site, aligned with points of pedestrian access, pedestrian crossings, public pathways, bicycle tracks, bus stops, street parking, the flow of vehicular traffic to the Site, and local facilities such as shopping centres, neighbourhood parks (CRIPs) etc. The neighbourhood context must be thoroughly considered, with the locations of circulation routes in the public realm clearly informing the placement of access points into the school site.

The main entrance is the point of access for all visitors. It should be prominent, clearly visible, well orientated, well sized, and easy to find by the pedestrians entering the Site, and it should be easily accessible from the car-parking area. The entrance should also provide a safe and secure environment for students.

Once in the School grounds, Users must be able to find the reception area in the Administration building without difficulty, and without requiring or obtaining access to the rest of the Site or other buildings.

Protection from wind and inclement weather prior to entering the main door must be provided.

Depending on the size of the Site, access to adjacent roads and the designed layout of the School, separate entrances for staff may be proposed.

The majority of students will not normally use the main entrance of the School. They will enter an open campus at defined points of entry around the perimeter of the site and make their way around the grounds to play areas and to entrances to their respective Learning Communities.

Depending on the proposed community usage of the School, entry to community-shared facilities may be shared with the main entry or form a clearly defined separate entry.

Suitable access routes from drop off points to the entrances must be provided within a reasonable distance.

Provision must be made within the Site for vehicle access to permit parents to short-stay park and drop-off or pick up all students. Particular provision must be made for parking for pre-school aged children (a parent or carer must accompany children to and from the pre-school building) and for children with special needs. This area should be proximate to the Pre-School entry. Vehicles must be able to enter and exit the Site in a forward direction without the need to undertake “3-point turns” or reversing manoeuvres (excluding access to parking bays).

On-Site roads and vehicular access must be kept to a minimum while ensuring ease of parking and access to the main entrance doors of the School. Consideration must be given to the expected flow of vehicular traffic to the Site from surrounding main and connector roads.

Pedestrian routes on the school site must take priority over vehicular ones. Where routes intersect the priority for pedestrians must be emphasised. Footpaths must be designed with safe and direct access in mind. There must be clear separation between vehicular traffic and pedestrian movement.

4.2. Provision for all Occupants

All occupied areas of the School and external civil works must be designed to provide safe, dignified and equitable access for all Users including people with disabilities, whether students, staff, parents or other visitors.

The design of the School must comply with the requirements set out in *AS1428; the Disability Discrimination Act (DDA); Disability (Access to Premises – Building) Standards 2010*; and *Human Rights and Equal Opportunities Commission (HREOC) – Access to Buildings and Services: Guidelines and Information*:

Other important issues that must be addressed in the planning of the Site include:

- minimising pedestrian travel distances
- weather protection to pedestrian paths and at entrances
- functional and safe access around the site for pedestrian and vehicular traffic (this must include traffic planning in relation to drop-off and pick-up zones for students by cars and, where relevant, buses, with separation of pedestrian and vehicle traffic)
- provision of parking for teachers, parents and visitors
- access for delivery, waste removal and service vehicles
- emergency access

4.3. Emergency Exits

All emergency exits must be NCC compliant, clearly signposted and easily found. Emergency exit signage must comply with the requirements for fire safety certification.

If stairs are provided, they must have a dual function providing functional area for school use as well as emergency circulation in order to optimise floor area.

4.4. Pedestrian Movement

Pedestrian movement through the Site must be well planned, safe and clearly articulated in both external areas and internal areas. The efficient movement of people from car parks and boundary entrances to buildings is essential in delivering a user-friendly School. Points of access and egress must be clearly defined and easily located.

A path network is required to provide all Users with a safe, functional and direct means of access from boundary entrances to and around buildings on the Site, and to external functional and play areas. While all paths around buildings must receive spill lighting from external security lighting, access paths that will be used before sunrise and after sunset (including paths connecting car park areas and points of pedestrian access to doors used out of hours) must be provided with safe levels of illumination along the length of the paths.

Pedestrian access must engage with adjacent streets and local and neighbourhood pedestrian and bicycle paths to facilitate and encourage pedestrian access to the Site. The Contractor must provide pathways to engage with public transport stops where applicable. The design for the Site must consider the best locations for flagged school crossings or similar over adjacent streets and provide safe pathways to these locations.

The building design and hard / soft landscape must be designed to enhance and integrate with the external pedestrian experience, as well as enhance and focus the views from the internal pedestrian experience wherever possible.

The layout of pedestrian access networks across the Site must consider the planned placement of transportable buildings to meet Long Term Enrolment and Peak Enrolment.

Pedestrians must be able to move from the Site entrances to the School and from places such as parking areas, using footpaths that will avoid crossing vehicle pavements where possible. Pedestrian crossings must be provided where footpaths cross paths of vehicle movement.

4.4.1 Pedestrian Paths

Path widths must suit their anticipated usage, comply with the relevant DDA access requirements and, in general, be a minimum of 1500mm wide. Increased width must be provided where paths will be shared by pedestrians and cyclists.

Education Directorates Infrastructure Specification – Part C: Master Planning and Architecture Specification – V3.0

Paths must be free of obstructions such as plant, equipment, furniture, fittings, projecting window sashes, or projections from external walls. The number of supporting columns to shelter structures over paths must be minimised.

Where Facilities comprise two or more buildings, covered pathways must be constructed to provide at least one sheltered pathway linking the main (administration) building with the outlier buildings and permitting travel between all outlier buildings under a continuous sheltered pathway.

Where changes of level must be managed, DDA compliant ramps are preferred to stairs. If stairs are provided, there must be an equitable ramp provision close to the stairs that leads to the same destination.

Where external access is provided to Learning Neighbourhoods, footpaths must be wide enough at building entrances to provide sufficient paved area for students waiting to enter.

Pedestrian paths must follow the most intuitive and logical way through the Site, enabling students and other users to efficiently travel between the Facilities. Paths should be designed using Human Factors Analysis to reduce the cutting of corners over gardens and landscaped areas.

4.4.2 Vehicle Traffic – Design Considerations

There will be significant vehicle traffic associated with the operation of a school. The Requirements for vehicle parking is outlined in *EDIS Part B – Functional Brief*. Unimpeded access for Emergency vehicles, must be provided to specified locations.

Commercial vehicle movements will require a considered response, signposting and space provision for temporary delivery parking. The Administration building is not intended to operate as a delivery bay, and few deliveries will be suited to direct receipt at the general office. Deliveries to the canteen or the DATS areas have a specific end destination and will involve the transport of goods (sometimes large and heavy) across the school campus. The optimum solution that reduces manual handling may be to have provision for vehicle access close to the end destinations. This must be balanced with the amount of space devoted to vehicle access and the risk in terms of the interface between vehicles and pedestrians. A signposted delivery parking bay must be provided close to the BSO office and Facilities Management Centre/ Bulk Store and Office. The Contractor may consider management solutions to address some of these deliveries and those alternative strategies must be clearly explained in the design response.

In developing the site master plan, and in designing the site response to car parking provision and vehicle movements, the Contractor must:

- consider the multiple vehicle movements that will occur at a school across a week
- consider the purposes, destinations and vehicle types that will be involved
- consider and resolve the safety risks associated with the interface between vehicle movements and pedestrians
- demonstrate how the design responds to and supports these many competing demands for vehicle access to and circulation around the site

4.4.3 Vehicle Access Roads

Vehicle access roads must provide functional and safe access onto the Site. For safety reasons, they must be separate from pedestrian access paths. On-site staff parking must be designed with minimal Site intrusion, and the extent of access roads must be minimised.

Each staff car parking area must have a single entry/exit point for vehicles. Appropriate sightlines and intersection operations must be provided for any vehicle access points. A safety assessment must be carried out during the Development Phase in consultation with Roads ACT to identify suitable locations for vehicle access. Points of access must be kept clear of intersections, pedestrian crossings, curves, and other locations where turning traffic impacts on safe traffic movement.

Provision must be made for access and short term parking for delivery vehicles. Where possible, delivery parking should be proximate to the delivery location, but delivery vehicle access must not take precedence over the safety and amenity of Users. Delivery vehicles must enter and exit the site in a forward direction. The Contractor must provide safe space for vehicle reversing manoeuvres where required. The car park layout must keep pedestrians separated from vehicle reversing movements.

Speed traps, signage, bollards and line of sight must be considered in the interests of safety.

4.5. Access for Emergency Vehicles

The Master plan design and civil works must facilitate access for emergency vehicles (such as ambulances and fire trucks) while minimising the length of on-Site trafficable pavements. In particular, provision must be made for an ambulance to park close to the first aid/ sick bay, and to the school sports field (where provided).

The master plan provision of access for emergency vehicles must be considered carefully in the context of Site topography, on-Site parking, student hard play areas, and zones where transportable buildings will be placed.

For ambulance access, all weather vehicle access must be provided from a surrounding street to the oval/ sports field by the shortest route.

4.6. Vehicle Parking Areas

The Contractor must provide adequate on site car vehicle parking. Refer to *EDIS Part B – Functional Brief, Section 1* for these requirements.

Crossovers between the car park and the street must meet all Quality Standards and Laws and be designed in the overall context of the School's urban design and integration into the surrounding area.

4.7. Bicycle Storage

Bicycle parking and sheltered storage must be provided on site for staff bicycles and for student bicycles/scooter. Refer to *EDIS Part B – Functional Brief, Section 1* for these requirements.

4.8. Resource Recovery and Waste Disposal

A screened and contained resource recovery/waste disposal area must be provided at the Site that provides space for storage of waste hoppers or bins and for the collection of school waste. The area is to be located to allow efficient, safe, lit night-time access for cleaning staff.

Truck access to the waste disposal area must consider other vehicular and pedestrian movements in the vicinity and must limit safety risks. The waste disposal facility must not be located directly beside a street frontage, but truck roads on site must be minimised. The waste disposal facility must keep pedestrians separated from waste vehicle movements.

5. External Environments

There must be an integrated approach to the design of external environments that will help define the character of the school, enhance learning and teaching, and provide a sense of connection to the school.

The design of external environments must:

- meet the requirements as described in *EDIS Part B – Functional Brief*
- consider how spaces are used and appropriated by different age groups and students with additional needs and what elements are required to activate these spaces to promote social inclusion
- have a consistent design intent between the architecture and the landscape
- define the functional role of each outdoor space. This will influence the size, level of enclosure and relationship of outdoor spaces with internal spaces
- Integrate the 30 percent canopy cover and 30 percent permeable surface targets of the *Canberra Living Infrastructure Plan*. It is noted that some sites will have exclusion zones that may constrain the ability to meet the targets
- conserve and respect the natural vegetation, topography, ecology and heritage of the Site and prevent soil erosion
- provide shelter from the prevailing winds and weather during the different seasons to extend the range of days during which the external spaces are comfortable
- demonstrate sustainable land management practices and landscape design that reflects the indigenous history of an area
- establish a hierarchy of open space to provide functional, adaptable, expandable and durable landscapes to support positive learning environments
- integrate interpretive and educational opportunities within the landscape to facilitate active and passive outdoor learning
- consider the main entry points, nodes, linkages and gateways for students and the local community
- develop different 'spatial experiences' between buildings to foster various modes of recreation, cultural experiences, gathering and socialising
- consider the visual outlook from internal learning environments. Where possible enable visual access to nature and exploit existing features such as mature trees
- ensure that the main structure planting is introduced as early as possible to provide identity, enclosure and shade to outdoor spaces
- consider the requirement for ongoing maintenance of outdoor areas and minimize seasonal impacts

5.1. Biodiversity

The design of external environments must incorporate the following strategies for maintenance of biodiversity, and for enrichment of the natural environment:

- Retaining existing native and endemic tree and understorey plant species (where possible)
- Use of native and endemic plant species to support biodiversity and in particular local fauna
- The plant palette is to incorporate climate resilient species from the nearest natural bushland areas to provide connectivity, increase the likelihood of migration of flora and fauna and reduce irrigation requirements

- New plantings to contain a variety of species and avoid monocultures
- Native and exotic food production gardens
- Composting and worm farming (see also Operational Waste requirements)
- Where in close proximity to buildings or where plantings surround outdoor courtyards plantings should be irrigated and include species with higher evaporation rates
- Deciduous trees to be planted to provide shade to building walls (prioritising north and west facing walls) and external areas to aid in providing thermal comfort in summer while maximising natural light into internal building spaces in winter
- Where feasible biodegradable mulches to be used to improve micro bacterial activity and reduce irrigation requirements
- Landscape features should advantage opportunities to slow surface water movement and increase stormwater infiltration, filter pollutants and provide habitat. Example features include retarding basins, detention in dry basins, swales and bioswales. *EDIS Part D – Technical Specifications* includes detail on Water Sensitive Urban Design (WSUD) requirements.

5.2. External areas

5.2.1 External Public spaces

For all external public spaces, consideration must be given to temperature control through wind protection, cross-ventilation, the capture of sunlight during cooler months, shading during warmer months.

5.2.2 Civic Presence

The landscape design should complement the master plan to enhance the civic presence of the school that is complementary of ACT schools. Structure planting should provide character and presence to the school both around the perimeter, within the major external spaces and along circulation routes.

5.2.3 Existing Trees

The Contractor must conduct a site opportunities study, through an approved Arborist, to inform its master planning process and identify any suitable existing trees that are proposed to be retained.

The Contractor must identify any existing retained trees that present a safety risk to students (e.g. river red gum *Eucalyptus camaldulensis* that will drop branches) and implement an appropriate management strategy and fence off the hazard area. During construction, the contractor must conform to *AS4970-2009, Protection of trees on development sites*.

5.2.4 Fencing

The design and detailing of fencing must be considered as an important part of the overall presentation of the school. Fencing forms part of the street image of the school, and quality, colour and construction must be coordinated with adjacent buildings. Fencing will define contained school property and will identify the boundary that outsiders are not permitted to cross. Schools contain outdoor play facilities that attract out-of-hours use. Fencing must secure the school site and outdoor spaces from unauthorised access.

5.3. Shade Areas

The Directorate's Sun Protection Policy requires that school grounds are provided with designated shade areas.

The ACT Cancer Council has developed the SunSmart program, which aims to minimise the human cost of skin cancer in the ACT. SunSmart works with the Directorate to promote a healthy UV exposure. The Contractor's design must support the School's capacity to seek SunSmart status, particularly by the provision of built and natural shade. (Refer *EDIS Part D - Technical Specification* for requirements).

The Contractor must provide areas of built shade and natural shade accessible to all students and staff and ensure that where outdoor play areas are provided for Pre-School or students with additional needs, that those areas are also provided with suitable playground shade.



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Part D: Technical Specification

Version 3.0 – Under Review

October 2021

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Part B – Functional Brief
Part C – Masterplanning and Architectural Specification
Part D – Technical Specification
Part E – Furniture, Fittings and Equipment Specification
Part F – Facilities Management (Services) Specification (if required)
Part G – Documentation Deliverables

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1. General

1.1. Introduction

An overview of the Project, and its requirements, is provided in *EDIS: Part A – Project Specific Requirements* of the Request for Proposal (RFP) and shall be referred to as needed to provide context and background to the various requirements outlined in this document.

The EDIS suite of documents are intended to be used in a priority order please refer to *EDIS: Introduction* for further information.

The Design Deliverables shall have an emphasis on quality and reliability by using materials, Plant and Equipment:

- from reputable suppliers
- from standard production lines that guarantee continuing availability of replacement products
- with robust, integrated and matched components appropriate to the task
- installed and commissioned in accordance with all relevant Regulations, Australian Standards and Industry Guides

The design and construction of the school, including its building services shall complement the delivery of the Education Services.

1.2. Design Life Expectancies

In accordance with Best D&C Practices, the minimum design service life of all construction work, services, systems and equipment from the Operational Commencement Date of the School shall be in accordance with the design life expectancies as contained in Table 1 below.

Table 1: Design life expectancies

System or item of equipment or element	Minimum design service life
Structural elements, including substructures	50 years
Floor structures	50 years
Roof structures	50 years
Internal structural walls	50 years
Roofing	20 years
Suspended ceilings	20 years
Termite protection	10 years
Sports Flooring	15 years
Engineering Plant	
Packaged air-conditioning plant	15 years
Boilers (if used for special applications)	20 years
Pumps	20 years

System or item of equipment or element	Minimum design service life
Dampers	20 years
Fans:	
Centrifugal	30 years
Axial and Roof Mounted (all types)	20 years
Propeller	15 years
Electronically Commutated Direct Current (ECDC)	15 years
Lifts	20 years
Lighting and controls	15 years
Electrical Sub-mains and power cables	20 years
Switchboards	30 years
Power outlets and switches	10 years
Data racks	10 years
Data cabling and passive infrastructure	20 years
PA system	10 years
Photovoltaic panels	25 years
Inverters	20 years
Reciprocating engines including diesel fuelled generators	20 years
Building Services Distribution Systems	
Ductwork	30 years
Pipework	30 years
Dampers, valves and actuators	15 years
Thermal Insulation and over-cladding (external and internal)	20 years
Civil works / other	
Asphalt pavements	20 years
Concrete pavements	40 years
Underground drainage	50 years
Water storage tanks	20 years
Retaining walls	20 years
Excavated water retaining structures	15 years

1.3. Design Criteria

The Contractor shall comply with all relevant Regulations, Australian Standards and Industry Guides. In addition, the Contractor shall comply with and satisfy the following minimum requirements:

- all Transport Canberra and City Services (TCCS) Directorate requirements, ACT Fire and Rescue (ACTFRS) requirements and utility supply Authority requirements including electricity, gas, water, sewerage, stormwater, communications
- all relevant written and implied Manufacturer's Installation Instructions

The School will be subject to the performance demands normally expected for school buildings, including heavy usage by young and adolescent students manifesting a range of behaviours and attitudes to their peers and to their surroundings. When making decisions on the selection of building structure systems, claddings, finishes, services, elements, fitments, detailing and the like, the Contractor shall allow for user behaviours including tampering and vandalism, and user demands that can be expected for a School.

1.4. Enrolment Numbers and Capacity

The Contractor shall ensure that the Utilities, Building Services and infrastructure have the capacity deliver the requirements for the Long Term Enrolment (LTE) of the School and the specified community or third-party use. The Contractor shall also ensure that planning for expansion is included to cater for the Predicted Peak enrolment (PPE) of the school (see 1.5). The Contractor shall include all design safety margins, considering factors such as redundancy, connection ratios of HVAC equipment and weather extremes (winter and summer) that prevail in the ACT.

The LTE and predicted peak enrolment figures for the school is defined in *EDIS: Part A – Project Specific Requirements*.

The spatial capacity for the different areas for the school are defined in *EDIS: Part B – Functional Brief*.

Note: Spare capacity requirements from utility supplies, the distribution infrastructure, and the associated spatial requirements, considering future expansion, are specified in the section below.

1.5. Redundancy, Capacity and Spatial provision for Future Expansion

The Territory has identified the Long-Term Enrolment and the anticipated PPE for the School, provided in *EDIS: Part A – Project Specific Requirements*.

The Contractor shall provide Utility Services, the Building Services and the necessary reticulation paths (space) and systems to serve the PPE with spare capacity, for future expansion as stated below. Note that spare capacity for future expansion is different to any safety factors that may be adopted during design when sizing equipment.

All services reticulation routes, from those running to central Plant and equipment locations to those routes through corridor ceilings shall be provided with a *spatial allowance* for accessibility and distribution of future services. 25% spare capacity (physical space) shall be provided in cable containment and pipe support systems.

The Contractor shall provide the following requirements with regard to building services and spatial provision to accommodate for future expansion:

The Contractor shall provide at least the designated spare capacity (in rating such as kW, kVA, A or L/s, units or spatial requirements- whichever is higher) for the following, noting that further details are provided in the specific trade sections:

- 25%: Above assessed maximum demand for utility services including incoming (electricity, gas, water) and outgoing- sewers
- 25%: Above the assessed maximum demand, for the electricity consumer mains, main switch board (MSB), main circuit breaker/isolator, busbars, each switchgear assembly and sub mains to switch boards, including distribution boards

- 25%: Above actual requirements for the cable containment and reticulation of installed site services and infrastructure, including cables for electricity, ICT, BMS, ICT, security and fire. Cable containment and reticulation systems shall include conduits, trunking, cable trays, ladders, busducts, and support systems
- 10%: Above the calculated maximum load (thermal load and electricity demand) for central HVAC plant and clustered (semi-centralised) equipment (such as VRF and multi-head units)
- Install: Water supply and drainage connection points, electrical power and communications conduits, to a location which is a maximum of 40m away from the proposed location of Transportable Classrooms

1.6. Flexibility and Adaptability of Building Layout and Structure

Adhering to the specific Education Facilities Design Principles the design and subsequent construction of the facilities and the facilities management systems must also be responsive to the requirements of individual schools i.e.:

- enable individual schools to implement their own learning and teaching approach e.g. ensure the schools can adapt to a range of different organisational models that may be developed by the school leaders, staff and community over the life of the facility
- enable school-based decisions concerning specialisation
- embed the potential for adaptability for varied current uses

Therefore, **the building layout must allow for the facilities be able to be reconfigured, without major re-construction and expense, to accommodate changing needs resulting from new learning technologies, curriculum changes and changing demands for use that might occur over the long term. As such this brief requires the minimal use of “load-bearing walls” in the internal construction to allow for ease of removal if required in the future. All architectural drawings must highlight clearly where the use of load bearing walls are intended for the design phase.**

The building structure shall allow satisfactory provision for the installation of equipment and reticulation of building services throughout the School and shall provide support for all identified current or foreseeable future needs.

Services risers (where provided), services cupboards and plant rooms requiring regular maintenance access shall be grouped into service zones on floors or within buildings. Services zones shall be located adjacent to floor access points such that the need for service technician intrusion into teaching and administration areas is minimised. Service risers shall be located adjacent to vertical structural features such as stairs and lift shafts (if any) to minimise structural ramifications and intrusion into occupied spaces and to minimise the need for offsets in vertical risers.

1.7. Flexibility and Adaptability of Building Services

The services in the School are likely to be subject to an ongoing program of alteration and/or modernisation to suit teaching and technological changes over the life of the School.

Therefore, the building services shall be designed to be flexible and readily adaptable. Such design shall allow change with minimal disruption to the operation of the School and at a minimum cost.

In addition to the general School use of building services, the services will, where required, supply multiple users including a range of community use during and outside of normal school hours. The School shall be designed and constructed with appropriate zoning, localised controls and sub-metering of services to allow for economical activation of services in community use areas, and to allow Utility consumption to be easily metered and itemised and charges allocated to the relevant user.

Design strategies employed to ensure satisfactory flexibility and adaptability shall include intelligent spatial planning, good access to all services, provision for Plant redundancy and replacement, and the provision of adequate means of isolating systems (mechanically and electrically) and parts of systems to safely carry out repairs, replacement and future upgrades., whilst minimising disruption.

Sufficient means of isolation shall be provided to all piped services, to allow shutdown of zones such as individual buildings, floors or highly serviced zones, to enable future upgrade works without requiring shutdown of whole buildings or whole floors or adjacent independently operational areas.

Services reticulation routes including service corridors and risers shall be designed to allow ready access for future works to be carried out. Services shall not be laid out such that any service has to be shut down and/or removed to access, work on or remove other services.

Seismic restraints shall be installed to all floor-standing equipment to comply with requirements of the BCA and AS/NZS 1170.

Ceiling spaces shall be zoned vertically, particularly within services reticulation zones, to minimise clashes between services. These vertical zones shall include a zone at ceiling level for lighting. A zone above this shall carry all cable trays. The zone immediately above this shall carry reticulated piping and any ducted services. The structural zone above this may also carry any additional services.

Note: structural members should not intrude into the electrical or piping/ducting zones. Where piped services require a gradient, these services may penetrate the zones conveying ductwork, piped services and cable trays, but not the lighting zone.

1.8. Resilience of Building Services

The School and its building services shall be designed to be resilient in operation against shock events that could cause disruption. Measures that are expected to be implemented include:

- The provision of vehicular and service access to easily replace plant, including ready access to all plant areas
- The avoidance of installation of water services, especially at high level, near electrical equipment including switchboards and IT services
- Stored rainwater (backed up by mains water) for flushing toilets
- Solar PV to continue providing limited electricity for essential functions
- The provision of vehicular access and a link box to connect an emergency (mobile) generator to the main switch board
- Minimising single points of failure in large, centralised plant such as centralised chillers and heat pumps. Install duty/standby configurations
- The provision of local means of isolation for power and all water services to isolate and replace equipment

1.9. Maintainability of Building Services

Ease of maintenance shall be a key consideration during design. This shall include Safety in Design (SiD) principles, ease of access to the equipment being maintained, availability of local lighting (including emergency lighting) and power supplies and safe means of isolation for emergencies and maintenance.

Key aspects to consider for maintainability include:

- air handling plant shall be located where possible at floor level with suitable maintenance access. Plant shall not be located in ceiling spaces above teaching areas, libraries and other areas that are used for educational or sensory activities

- Compartments within equipment such as air handling units shall have switched lighting (centrally switched at the AHU with a switch having a neon indicator) to facilitate inspections and maintenance
- service reticulation zones within ceiling spaces shall be provided and shall be accessible from removable tile ceiling areas or access panels, neatly and clearly (but discretely) identified, that allow full and proper safe access to all services for maintenance, replacement and/or addition of services. Services requiring access, including in ceiling spaces and walls shall not require access through teaching areas or administration offices during core hours. Services reticulation zones shall be restricted to spaces over corridors and non-teaching areas, including cleaners' rooms, toilet areas and lobbies
- Provide ready access with clear identification (engraved trafficolyte labelling) to equipment that need testing adjustment and balancing (TAB), routine inspection and servicing and isolation for maintenance. These include all equipment installed in plant rooms and distributed equipment including air filters, drive belts and pulleys, isolating valves, balancing dampers and valves, motorised actuators dampers and valves, refrigeration branch boxes, thermostatic mixing valves, condensate pumps, sensors, detectors and all controllers
- Isolation valves shall be provided to all piped services, components and equipment to allow shutdown of individual components, rooms, part-floors or part-buildings to carry out maintenance, with minimal disruption to the activities within the occupied areas. For example, maintenance works in a toilet area shall not require shutdown of services to adjacent teaching spaces; Each toilet block and laboratory shall have zone isolation valves for all piped services (water, air and gas) to enable maintenance within the room to be carried out with minimal disruption
- All equipment such as pumps, strainers, toilet fixtures, taps, drinking fountains and beverage machines shall have local isolation valves installed. External water outlets (hose taps) shall have isolation valves. Installed upstream to facilitate maintenance
- Safe and unimpeded access shall be provided to any equipment that needs adjustment, periodic inspection and cleaning. These include air filters, air intakes, condensate trays, heat exchanger coils, discharge traps, BMS field items including motorised valves and dampers, sensors, control valves, fire and smoke dampers
- For Air Handling Equipment and Systems, ready access for periodic inspections in accordance with requirements in AS/NZS 3666 shall be provided
- Plant and equipment located in ceiling spaces shall be designed and constructed to be readily removed for future maintenance without the need to break down components to avoid clashes with structural and other building elements. Access points shall be individually labelled on the ceiling with Trafficolyte-type labels (flexible sticky-type tape is not permitted) with equipment designations and identified on design and as-fitted drawings
- Access for maintenance shall be addressed from early design stages through the application of Safety in Design principles. The installation of luminaires, emergency luminaires and signs and other equipment (or components such as BMS field items) at high levels where access is hazardous, shall be avoided. Equipment that requires routine servicing shall have safe access, without the need for specialist equipment such as elevated work platforms
- Electrical isolation shall be provided locally to all equipment including indoor and outdoor HVAC equipment, hand driers, water heaters. Isolators shall be lockable and suitably protected. from weather and vandalism. Isolators shall be clearly marked, identifying the equipment they serve
- All isolation switches (including emergency power off switches) and valves shall be placed away from locations where tampering or vandalism could occur. Where placement in such locations is

unavoidable, suitable arrangements including lockable enclosures, isolators or valves shall be provided

- Where Building Services such as HVAC units, are located internally in plant rooms and externally, lighting and suitably IP rated 230V 1 Φ power supplies shall be provided for maintenance activities, such as the powering of laptops, portable tools and refrigerant evacuation systems, without the need for extension leads. All internal plant rooms shall have lighting, emergency lighting, fire detection and alarm systems (when required by the NCC) and portable fire extinguishers
- All external Building Services plant shall have switched weatherproof lighting to enable safe maintenance access at night

1.10. Design Guidelines for Site Services and Building Services

The Contractor shall:

- give priority to the needs of School Users
- ensure that Site connections to mains services (including above ground protective cages and enclosures around valves, meters and controls) are positioned well clear of the School's main pedestrian entrance and vehicular access routes
- ensure that the School's main pedestrian entrance and vehicular access routes are free from service pit lids, access and inspection covers and other potential trip hazards
- provide a zone 20m each side of the edge of the pedestrian entrance footpath reserved for landscape works (including lawn, planting beds, school signboard, school letterbox, lighting etc.), but excluding mains services valves, cabinets, meters, controls and the like
- ensure that the placement of external services and plant does not create an easy route for unauthorised access to the building and the roofs
- Security lighting shall not be placed within 3 m of air intakes, to prevent ingress of nocturnal insects

1.11. Plant Space and Reticulation

1.11.1 Plant Space

Engineering Plant and equipment installations shall be arranged such that Plant and equipment that generate noise and/or requires scheduled inspections and maintenance is located outside of teaching or occupied accommodation areas.

Where possible, equipment shall be located within plant rooms, dedicated services cupboards, or above un-occupied areas.

Where riser shafts are used, all riser shafts shall be fully accessible for the height of the riser. Plant and equipment requiring access in services cupboards shall be limited to a maximum height of 2.2m above floor level. No Plant or equipment shall be located such that access to or in riser shafts is impeded.

Plant and equipment shall be located to prevent noise, vibration and electromagnetic interference. Plant and equipment accommodation shall also take into account the acoustic requirements of adjoining occupied areas.

Access to equipment in plant rooms shall be via normal walk-in access and shall not require the use of specialised access equipment or temporary scaffolding. Permanent access platforms and ladders shall be provided where safe maintenance access is not possible from floor level.

Plant and equipment access shall take into account the access needs for the replacement of all major components. Access and removal routes shall be planned.

Outside air intakes shall be arranged to minimise the risk of air recirculation under prevailing wind conditions, or cross contamination from nearby exhaust discharges and flues. Where such risks could apply, safety signage shall be applied to warn motorists not to run engines near air intakes.

Schools are unoccupied for large parts of each day and are vacant for extended periods over holiday breaks. When placing expensive and potentially dangerous services equipment outside, the Contractor shall make all necessary provision for security and protection against theft and vandalism.

1.11.2 Services Reticulation

Service routes shall be designed such that clearly identified pathways are provided for piping and cabling installations from central plant or clustered equipment plant, such as Variable Refrigerant Flow (VRF) units or multi-split units to final usage points.

Zoned ceiling spaces for the reticulation of services with appropriate access shall be provided. All services shall be segregated in accordance with requirements in Regulations, Australian Standards or Codes to suit the function and type of service. Segregation shall consider electrical safety, electromagnetic compatibility and maintenance requirements.

Cables shall be segregated into high voltage, low voltage, communications, fire services, BMS and security services. When cables are run through metallic frames, the holes shall either be punched through (with a radiused edge) or grommets to prevent chafing.

All services shall be fully supported along their length, using means such as cable trays, conduits or catenary. Services shall not be supported by an accessible or lightweight ceiling structure.

Where services such as cables and plastic pipes penetrate through members, the holes shall be of the punch out type or have grommets to prevent damage. All gas, refrigerant and water pipes shall be sleeved when passing through masonry walls or steel members.

1.12. Quality of Materials and Equipment

Materials and equipment used throughout the Project shall be new, of good quality, free of defects, fit for purpose and in general conformity with applicable Australian Standards.

In general, the Territory requires that products and materials be used that:

- cause no danger to the health of users or of others
- cause no significant damage to the environment during manufacture, use or disposal
- do not consume a disproportionate amount of energy or water during manufacture, use or disposal
- do not cause unnecessary waste, either because of over-packaging or because of an unduly short lifespan
- are not derived from threatened species or sourced from threatened environments

Materials selection, including construction materials, finishes, joinery and any free-standing furniture shall be made on a whole of life basis, including consideration of:

- Capital costs
- Asset lifespan
- Fitness for purpose in a school environment, including proven track record

- Cost and frequency of maintenance and replacement parts
- Ease of maintenance and upkeep, including local servicing capability
- Durability including resistance to wear, ultraviolet, heat and water
- Ease of sourcing replacement parts
- Cost of disposal of system or components at end of life
- Ability to provide flexibility for updates and/or changing usage profiles
- Sustainability issues including:
 - Reused or recycled content
 - Recyclability and disposal at end of life
 - Ecological and emissions impacts of material sourcing, manufacture, transport and end of life disposal

1.12.1 Consistency

Where a product is repeatedly required in multiple locations, the Contractor shall consistently use the same product in each location, using standardised methods of installation. Where feasible, multiple equipment shall be from the same manufacturer.

1.12.2 Second-Hand Materials

Where the Contractor proposes to use second hand or recycled materials, such use shall be subject to consideration by the PAP who reserves the right to accept or reject any proposed use of second-hand materials, based on an assessment of the offer and the materials. If accepted, second-hand materials shall be clean, safe, in good condition and have performance characteristics suited to the use and location. The Contractor may be required to submit representative samples for review.

1.13. Protection from External Exposure

- Where long term exposure to rain, sunlight, ultra-violet (UV) rays and dust presents a risk of degradation of external equipment, services or materials, the contractor shall provide protection in the form of shelters, covers, conduits, shields and the like
- All external cables (power and controls including final connections) shall be run within UV proof conduits
- All external flexible connections (ductwork and pipes) shall be shielded from the weather using demountable shrouds
- All external pipes (water or refrigeration), with thermal insulation, shall be run within galvanised steel or UPVC conduit or trunking, having means of access for inspection. Where such covers are run at low level, they shall be trafficable, noting that galvanised steel ducting is not trafficable
- All external BMS and other control devices such as actuators and sensors shall be shielded from the weather using demountable shrouds
- Galvanised screws or toggle catches shall be used for providing ready access to external trunking, weather shrouds, and other access panels. Pop rivets shall not be used

1.14. Labelling of Building Services

All equipment, switchboards, power outlets, isolators, piped and ducted services, isolating valves BMS and controls field items, manual controllers and indicator lights, shall be clearly labelled with weather -proof

engraved traffolyte labels. Access panels including and ceiling grids near equipment shall be identified (labelled) with the equipment they provide access to, with the same Traffolyte labels.

Doors leading to the main electricity, gas and water isolators and isolation valves shall have prominent signage applied, and the means of isolation for emergency use shall be prominently labelled.

All in-wall type tundish drains shall be labelled with the equipment reference that they serve to drain from. Also, a label shall be applied: *"If water is seen to be dripping through this window, please advise maintenance services immediately"*.

1.15. Operating and Maintenance Manuals

A comprehensive O&M manual is required in hard copy and electronic format for all equipment, whether fixed, mobile or portable. The manual shall include at least the following sections:

- contact details for design consultants and installation contractors. Contact details, including emergency contacts for planned and reactive maintenance
- warrantee and defects liability periods
- system operation and control – including WHS issues related to maintenance, fire mode operation & re-setting and descriptions for emergency shut-off
- applicable regulatory requirements, including statutory maintenance requirements such as for TMVs, Air Intakes and Air Filters: AS/NZS 3666, Fire Protection Systems: AS 1851 and Emergency Lighting: AS/NZS 2293
- maintenance regime requirements/spare parts/special tools specific to equipment manufacturers' requirements (not generic material)
- comprehensive equipment schedules (including make, model, location serial number), manuals and/or technical data sheets – in English
- accurate "as -constructed" drawings, not simply-retitled "for construction" or shop drawings, including for all buildings works, all site works, all engineering services, details of electrical switchboards (MSBs, DBs, MSSBs) including circuit schedules, electrical distribution single line diagram and BMS metering tree for all new submeters installed. The location of access panels shall be marked clearly on "as -constructed" drawings
- controls: BMS functional description and points list; lighting control system
- testing and commissioning data: for HVAC (air and water side), refrigeration – split systems and VRFs, electrical power, lighting (illuminance and controls), domestic hot and cold water, security and access control, safety systems
- fire services: provision of baseline data for maintenance, in accordance with AS 1851
- design certificates (from the Design Consultant) and installation certificates (from the installer) for all services covered in the NCC and for the Electrical Systems
- certificates: communications systems, refrigerant charge limit calculation, manufacturers' warranty certificates, pressure test certificates, equipment pre-commissioning and manufacturer's commissioning certificates for specialist equipment such as chiller & VRF systems
- calibration data: to NABERS procedures calibration of for energy and water submeters
- a Building User Guide for maintaining thermal comfort conditions in building interiors, including guidance on HVAC systems, blinds, lighting controls, ventilation, heating and cooling. The BUG should

also contain information from the designers on how each space or combination of spaces were designed to be used. E.g. acoustically and spatially (Architectural and/or Education Planning aspects)

- pre-sheeting photographs of all internal walls and ceilings during construction and prior to installation of insulation and linings. This shall include drawing documentation marked up to show where each photo was taken in the building and reference the date on which it was taken
- schedule of colours and finishes used, including details of name, supplier or manufacturer, code number and location Index
- all equipment and system identification, including:
 - all regulating and measuring devices in the system
 - final accepted values of commissioning data (e.g. air flow/water quantities, voltage/current, signal strength, etc.)
 - final settings of all regulating devices
 - major equipment maintenance schedules/servicing access clearance requirements
- operating and maintenance manuals are to be fully indexed and tabulated and shall be internally quality tested and approved by the Contractor prior to forwarding to the PAP for approval prior to issue of a Certificate of Practical Completion

The Contractor shall issue before Practical Completion the O&M manuals, covering, without limitation:

- architectural
- civil
- structural
- landscape – softscape
- landscape – hardscape
- traffic
- signage
- hydraulic services
- mechanical services
- controls and BMS
- electrical services
- essential services maintenance requirements
- lighting
- solar PV and thermal systems
- IT and communications
- security alarm system
- access control system
- lifts

- fire manual detailing the design, operational parameters, fitment selections, operations procedures and maintenance requirements of the Fire Protections Systems, and as-built drawings of the installed system
- manuals and training for operations and maintenance shall be completed not less than 10 Business Days before the Date of Practical Completion or not less than 10 business days before any element of the work under construction which will require a change in operating or maintenance procedures first enters service, whichever is the earlier

1.16. User Training

The Contractor shall develop and provide training sessions that explain how users are to operate the facilities, use and operate individual building services systems, IT and communications systems, items of plant, machines, items of infrastructure, and the like, and to explain how the users are to engage with and utilise the resource provided by the Contractor during the Operations Phase.

Training shall be structured, targeted to the requirements of the training cohort, supported by notes, charts, presentations, delivered in a suitable training environment, and shall include – where appropriate, practical demonstrations.

Training sessions and training content shall be recorded on video, and the Contractor shall issue a record set of training manuals and notes, including PowerPoint presentations, all material presented electronically, and training videos of any demonstrations (CD & DVD) related to building systems and other relevant instructions for operating buildings services.

1.17. Project Deliverables and Design Reviews

ACT IDPG will implement a design review process to ensure that project requirements are being addressed.

Contract Deliverables are as per the contract conditions and Returnable Schedules in the Contract.

2. Legislative Requirements

2.1. Compliance

The Contractor's activities and delivered works shall comply with:

- All Acts, Ordinances, regulations, by-laws, orders, awards and proclamations of the Commonwealth and the ACT
- the current version of the Building Code of Australia (Volumes One and Two of the National Construction Code (NCC) and EDIS document suite
- the regulations, directives and guidelines of statutory authorities having jurisdiction over the Project
- the regulations, directives, guidelines and requirements of utility supply agencies, as they apply to the Project works
- the regulations, directives, guidelines and requirements of Transport Canberra (Buses), as they apply to the Project works
- the requirements of all relevant Australian Standards (being the current edition, and all relevant parts or sections, of a named Standard or any relevant Standards published by Standards Australia)
- ACT Work Health and Safety ACT 2011 (incorporating all subsequent amendments)
- the National Code of Practice for the Construction Industry

2.2. Development Approval

The Contractor is responsible for

- developing a design that complies with the ACT Planning and Development Regulation 2008
- producing a complete and compliant Development Approval submission
- negotiating any exceptions to the Planning and Development Regulation 2008 that are permissible under Subdivision 1.3.6A.2 Exemptions – schools
- obtaining Development Approval for the Project
- paying all fees and charges relevant to the application
- compliance with the procedures and requirements of the relevant Territory Authorities and Agencies (including ACT EPSDD, TCCS, Evoenergy, Icon Water, Roads ACT, Transport Canberra, etc.)

All procedures set down in the ACT Environment and Planning Directorate website shall be followed, to the satisfaction of the responsible Authority, including:

- attendance at pre-application meetings
- facilitating community consultation
- supporting the application through any required public comment process
- managing compliance with the Heritage Act 2004 and the Tree Protection Act 2005, insofar as these Acts are applicable to the Project
- compliance with the TCCS Urban Design Standards and Specifications
- demonstrating that the design supports the key principles of the Crime Prevention Through Environmental Design (CPTED) General Code of the Territory Plan

The Contractor shall prepare and submit a pre-DA lodgement community consultation form to determine the type of community consultation appropriate to the Project.

All consultation shall be undertaken in accordance with the principles detailed in the Chief Ministers Department Community Liaison Group's Consultation Protocol.

The Contractor is responsible for providing, in sufficient time to avoid delay to the Development Approval application, notice to ACT Procurement and Capital Works where it is necessary for that agency to provide information, comment, documentation or consents, with clear details of the information or response sought.

2.3. ACT TCCS Asset Acceptance

The documentation and works delivered by the Contractor shall meet the ACT TCCS for Asset Acceptance.

The Contractor shall be familiar with the TCCS Asset Acceptance process, liaise and coordinate with TCCS in the submission of required review documentation, utilise and comply with TCCS standard details and standard specifications, and make all necessary arrangements to secure Asset Acceptance (including Design Acceptance, Operational Acceptance and Final Acceptance) in accordance with the project delivery timelines.

Where TCCS requires bonds to be lodged for any part of the works, the Contractor shall lodge such bonds, and is responsible for delivering works to a standard that will permit the bonds to be released and returned.

2.4. Performance Solutions

Details of any Performance Solution adopted under the National Construction Code Volume One which does not satisfy the Deemed-to-Satisfy Provisions of the NCC shall include all relevant plans and supporting documentation, including engineering calculations, demonstrating compliance with the Performance Requirements.

Details of the Performance Solution shall include the relevant performance requirements, the assessment method used, details of expert judgement relied upon, details of tests or calculations used to determine compliance and any other standards relied upon to make the decision.

A proposed Performance Solution shall be agreed and supported by the Territory. The Contractor shall provide the documentation and application in an approved format in accordance with the BCA acceptance method and documentation of the decision.

The Territory will not support dispensations for the convenience of the Contractor.

2.5. Safety in Design

The Contractor shall comply with the requirements of *Work Health and Safety Act 2011* (WHS Act) – in particular section 22 of the Act. The WHS Act is supported by Work Health and Safety Regulation 2011, Codes of Practice and guidance material. The WHS Act has safety duties which apply to anyone who has control of the design or manufacture of plant, a workplace or a system (including anyone who has the authority to make decisions about design or manufacture).

Safety in Design from an operational and lifecycle maintenance perspective is a requirement of this Contract. The Contractor shall design the school so that – when constructed – it is safe and does not pose risks to the health, safety and welfare of people working there (including staff and students), when using the workplace for a purpose for which it was intended.

The Contractor shall:

- complete Safety in Design (SID) reviews throughout all of the design phases under this contract, to satisfy WHS requirements. The SID assessment shall consider the principles of “so far as reasonably practicable” and apply a hierarchy of controls, risk reduction and mitigation

- engage with the Territory and use a structured methodology for identifying risks (phase 1) and for eliminating and managing risks (phase 2)
- use a risk analysis approach, and risk workshops to consider the scope of the Project as a work environment. Identify the range of workers who will be employed at the site, and their work tasks. Progressively develop the design using the “Preliminary Hazard Analysis” which identifies a range of different types of hazards and risks as part of managing risk. In iterative design reports, identify the design team’s response to identified hazards and safety risks, including providing clear and traceable evidence that the design has been refined and changed to eliminate or reduce identified safety hazards. For each design decision that carries a legacy maintenance or repair requirement, consider the design solution for the perspective of a safe working environment
- document and submit copies of the design team’s “Preliminary Hazard Analysis” and the response to identified hazards including evidence that the design has been refined and changed to eliminate or reduce identified hazards

2.6. Planning for Bushfire Risk Mitigation

Where the Project Site is located in or adjacent a Bushfire Prone Area of the Territory, the Contractor’s design shall consider the risks of Bushfire in relation to the Project and develop a Bushfire Risk Assessment (BRA) that examines the potential for bushfire to impact upon the Project.

The Contractor’s design and facility maintenance methodology shall demonstrate that it responds to the risks identified in the BRA to protect the safety of users, and to protect the assets of the Project.

The BRA shall be conducted in accordance with:

- AS/NZS ISO 31000:2009 risk management principles and guidelines
- ACT Strategic Bushfire Management Plan Version 3 (SBMP)
- ACT Planning and Land Authority General Code – Planning for Bushfire Risk Mitigation (2008)
- AS3959-2009 Construction of buildings in bushfire prone areas

2.7. Conservation and environmental Impacts

The Contractor shall identify any areas associated with or adjacent to the Project site which:

- have a nature conservation status
- are designated sites of natural or cultural significance, as recorded by the Heritage Unit, Environment ACT (see below)
- are gazetted under the Nature Conservation Act, Roads and Public Places Act or the Heritage Objects Act
- are important ecological areas
- are recorded by the Environmental Protection Unit, Environment ACT as a known or potentially contaminated site (see below)

The Contractor shall identify the location of all sites of natural or cultural significance in the area affected by the Project and shall document and implement a Cultural Significance Management Plan to the satisfaction of the responsible Authority.

The Contractor shall prepare an Environmental Management Plan which identifies all potential adverse environmental impacts of the project (on a known or risk assessment basis) and the measures that will be implemented to reduce or eliminate these impacts. The Contractor shall obtain an environmental clearance

under the Environment Protection and Biodiversity Conservation Act 1999, and/or the relevant ACT Environmental Legislation.

Where existing structures are to be removed, the Contractor shall conduct a comprehensive Hazardous Management Survey. The Contractor shall submit a demolition plan and the Hazardous Management Survey report to the Environment Protection Authority and shall make application for EPA Authorisation under the Environment Protection Act 1997.

Where necessary, the Contractor shall consult with the Environmental Protection Unit, to obtain relevant information on known or potentially contaminated sites as recorded by the Environmental Protection Unit in the Contaminated Sites Management Database (CSMD), Contaminated Sites Geographic Information System (CSGIS) and contaminated sites Register under the Environment Protection Act 1997.

2.8. Pollution Control

The Contractor shall obtain the approval of the Environment Protection Authority in regard to any requirements of the Authority for either:

- erosion and sediment control or
- noise control during construction

2.9. Food Business Premises Regulation

The School Canteen/Cafe shall be a food business premises (operating as either a registered food business or as a registered non-profit community operated food business), and shall be designed, constructed and equipped to comply with the Food Safety Regulations and other requirements of the ACT Health Protection Service relevant to food business premises.

Without limitation, the canteen shall comply with ACT Health Protection Service standards and regulations for:

- suitable food contact surfaces
- suitable lighting and ventilation including kitchen extraction hoods
- staff toilet facilities
- handwashing facilities
- provision of storage for staff clothes and personal items
- provision of safe storage for cleaning chemicals and cleaning equipment
- design and construction to facilitate cleaning of the premises
- provision of suitable spaces for waste storage and waste removal
- appliances and fitments for washing of equipment, cookware, utensils, and the like
- appliances suitable for the safe storage of raw and prepared foods before sale
- appliances suitable for storing and displaying prepared foods at safe temperatures (cold, warm and hot)
- pest and vermin barriers and controls (screens, electric insect control, etc.)

2.10. ACT Fire and Rescue

The Contractor shall initiate consultation with the ACT Fire and Rescue (ACT FRS) early in the design process. The Agency may identify requirements including fire isolation, hydrant and hose reel locations, access requirements (personnel and vehicles), interlocking of plant controls, shutdown under fire alarm conditions,

etc. and the Agency's recommendations or requirements shall be incorporated in the design and the delivered Facilities.

3. Civil Engineering

3.1. Design Criteria

The Site civil works shall also be in accordance with the current versions of the following:

- Relevant Authority requirements, guidelines and standard drawings, including Parking and Vehicular Access Codes, even if the project does not require a Development Application (DA). Guidelines and Standard Drawings
- TCCS Codes of Practice, Design Standards and Standard Specification for Urban Infrastructure Works, and Standard Drawings
- Austroads Pavement Design Guide
- Austroads Guides to Road Design
- Austroads – Guide to the Design of New Pavements for Light Traffic
- Cement Concrete & Aggregates Australia guidelines
- Australian Rainfall and Run-off

3.1.1 Peak Enrolment (PPE)

The Contractor shall make provision for all civil engineering elements for the PPE Peak Enrolment for the School and any Non-Mandated Community Facilities. This shall include servicing any Transportable Classrooms that will be required to accommodate the Peak Enrolment.

3.1.2 Design Flexibility

The layout and levels of roadways, paths and drainage shall be such as to allow for future development on the Site.

3.2. Stormwater Drainage

A drainage system shall be provided to fully drain the Site, taking into account all contributing catchments and any statutory requirements for on-site stormwater detention. Drainage systems in the region of buildings and paved areas shall be a combination of open inverts, kerb and channel and underground drains as appropriate. Surface drainage in grassed areas may be collected by swale drains and sub-soil soaking trenches.

The drainage design shall be fully co-ordinated with other external designs, for example landscaping, to ensure that all areas are adequately drained, there is no ponding, and overland flows are not detrimental to the functionality of the School. All external surfaces shall have a secondary route for overland flow of stormwater in the event that the underground drainage system fails or is insufficient.

3.2.1 Legal Point of Discharge

The legal point of discharge for the Site shall be obtained by the Contractor from the relevant Authority.

3.2.2 Surface Grades

External surfaces shall be designed to promote runoff away from building entries, pavements and other sensitive areas with sufficient grade to prevent the risk of ponding on the surface. Consideration should be given to shedding hardstand areas onto garden beds and grassed areas to improve the overall water infiltration and improve water quality on the site.

3.2.3. Recurrence Intervals

Drainage systems shall cater for the design storm event listed in Table 3 below and shall have sufficient capacity to accommodate the design flow in accordance with the drainage condition requirements. The Contractor shall give due consideration to the potential impacts that climate change may have on these design storm events.

Table 1: Design Storm Event

Drainage System	Design Storm Event (ARI)	Drainage Condition
Underground drainage	5	Pipes flowing full but not under pressure. Minimum freeboard to pit cover = 0.2m
Kerbs and channels	5	Maximum flow width = Refer Austroads Guide to Road Design Part 5A
Swale drains	5	Freeboard 20% of the flow depth
Overland Flow Paths	100	No flooding to school buildings (refer Sections 3.2 and 3.2.4)

3.2.4. Flood Levels

The Contractor shall consult with the Territory and Municipal Services Directorate and with Icon Water Limited and ascertain whether the Site is affected by land subject to inundation overlays, or is identified to be subject to overland flow, or falls within an area predicted to be affected by flooding.

If these investigations identify that the relevant Authority has designated criteria for setting floor levels, the Contractor shall firstly verify that the Design Deliverables sets building floor levels at or above the mandated levels, and then shall verify that the as-constructed floor levels conform with the Design Deliverables and the requirements of the relevant Authority as soon as floor levels have been set. The Contractor shall ensure that works to and around buildings are coordinated with the requirement of the relevant Authority to manage overland flow.

If the relevant Authority does not have designated criteria for setting floor levels, then floor levels shall be set at least 600mm above the 100-year Average Recurrence Interval (ARI) flood level.

The Contractor shall give due consideration to the potential adverse impacts that climate change may have on historic flood levels.

3.2.5. Pipe Sizes

Pipe sizes shall not be less than:

- DN (nominal diameter) 150 for surface grated inlets and with a 150mm airgap between base of down pipes and surface grated inlets
- DN150 downstream of any grated pit or grated inlet
- DN225 downstream of any side entry pit

Junction of pipes DN300 or smaller shall be made either with oblique or sweep junction proprietary fittings, or at pits.

Junctions of DN100 or DN150 pipes with DN375 or larger pipes may be made with saddle type fittings.

Junctions of pipes DN225 or larger with DN375 or larger pipes shall be made at pits.

3.2.6. Pipe Material

Pipe work materials shall be:

- For DN100 and DN150 – solvent jointed UPVC (except as noted below)
- For DN225 and greater on straight runs without junction fittings – rubber ring jointed reinforced concrete or rubber ring jointed fibre reinforced cement
- For DN225 and DN300 straight runs with junction fittings – solvent jointed UPVC or rubber ring jointed fibre reinforced cement

In areas of expansive/ highly reactive soils, UPVC pipes (if used) shall be rubber ring jointed.

The pipe class shall be appropriate to the design loading conditions.

3.2.7. Pit Structure

All pit construction shall conform to the relevant Authority standard. Pits may be constructed from in-situ reinforced concrete or precast concrete units. The use of other materials such as plastic for pit construction shall be subject to any restrictions imposed by the relevant Authority.

Pits shall be designed to at least meet the same loading requirements as the pit cover or grate classification.

Pit spacing shall be no more than 100m.

3.2.8. Pit Covers

Pit covers and grates shall be of a tight fitting bolted down design or have sufficient weight to prevent their easy removal. The classification of the cover or grate shall meet the loading expected for the pit location.

Heel proof ("Heelsafe" or equivalent) type grated pit lids shall be installed on stormwater pits set into footpaths and pavements.

3.2.9. Rainwater Collection

As context for design decisions on rainwater collection, the Contractor shall refer to Section 8.5, Water Performance for requirements regarding the ESD requirements for water efficiency and reduction in potable water consumption.

It is expected that the required reduction in mains water use will be partly achieved by the retention and re-use of stormwater on Site through the use of water tanks and pumps. This water can be used as an alternate source of supply for the needs of the School where non-potable water is suitable (for example toilet flushing or irrigation of natural grass areas and garden beds). Refer to the Section 13, Hydraulics Services for tank details.

Rainwater tank installations shall have ACTPLA approval and shall comply with the Australian Capital Territory Rainwater Tanks Guidelines.

3.2.10. Water Sensitive Urban Design (WSUD) – Stormwater Discharge

As a minimum, sediment traps and trash screens/baskets shall be provided as a primary means of controlling the quality of stormwater discharge from the Site. Appropriate protection measures to prevent access to such devices, especially by students, shall be provided. Secondary and tertiary treatments may be required to meet the best practice environmental management guidelines pollutant removal targets. Refer to Section 8.5.3 Stormwater for the ESD performance requirements regarding stormwater quality and quantity.

Works shall be designed, constructed and vegetated to avoid erosion, and minimise scouring in swales.

3.2.11 Provisions for Maintenance

Drainage systems shall be designed to be readily accessible for cleaning and unblocking.

3.3. Pavements - Roads, Parking Areas, Footpaths and Hard Courts

3.3.1 Site Investigation

A geotechnical investigation shall be carried out to support the design of the pavements. The investigation shall include a Site classification and determination of the California Bearing Ratio values.

3.3.2 Design Life and Vehicle Numbers

The car parks and access roads shall be designed for the appropriate traffic loads anticipated during their design life. Consideration shall be given to the construction traffic and access for heavy vehicles such as firefighting, delivery vehicles, cleaning vehicles, waste vehicles, buses etc. For vehicle parking requirements refer to *EDIS – Part B, Functional Brief*.

The design of pavements shall also be coordinated with the designed route for transportable classroom transport and delivery onto the Site. Where the defined vehicle access route crosses vehicle or pedestrian pavements, the pavements shall be designed and constructed to be able to support the weight of a low loader vehicle carrying a transportable building without damage.

Turning areas, hard standing areas and car parking shall be designed to provide a robust and long-lasting construction suitable for their purpose.

3.3.3 Vehicle Access Roads and Parking Areas

On-site vehicle access roads and vehicle parking areas shall be paved with one of the materials identified in Section 3.3.8, and edged with concrete kerb and channel, with concrete kerb ramps or other access features provided where required. Heavy duty surfaces shall be provided at locations where increased wear can be expected (e.g.: where waste collection vehicles or buses will travel and turn).

On-site vehicle access roads and vehicle parking areas, and the constructed interface between project roadways and ACT Roads assets outside the property line, shall all be constructed in accordance with the standards and standard details published by Roads ACT. The finished works will be subject to ACT Roads Asset Acceptance, and the Contractor is solely responsible for ascertaining those requirements and for delivering finished works that meet the Asset Acceptance criteria.

3.3.4 Pedestrian Footpaths

The Contractor shall comply with the NCC and relevant Australian Standards in the design of pedestrian pavements, including the provision, passing areas, tactile ground surface indicators and stair tread nosing's of suitable contrast colour. Compliant handrails and balustrades shall be provided at all ramps, stairs and at the top of retaining walls that are over the threshold height as per the NCC requirements. All retaining walls under the threshold height should have copings suitable for seating. Handrails, external dividing walls and retaining walls, shall not create opportunities for unauthorised access to roofs or windows. Designs shall also conform to relevant local Authority requirements and the Cement Concrete & Aggregates Australia guidelines.

As a minimum, concrete or asphalt hard paved all weather pedestrian footpaths shall be provided for all paths (including steps and ramps) at the Site. The design for footpaths and pedestrian pavements shall consider the following:

- provision of a continuous even surface free from trip and slip hazards

- appropriate thickness, jointing and reinforcement to meet design life requirements without excessive cracking
- surface water runoff, both on and across the footpath surface (so that water does not pool on the surfaces)
- matching into adjacent surfaces
- protection from root growth
- a surface texture and pavement strength appropriate for intended use of the pavement and to ensure safe passage of pedestrians (and vehicles, if and where required).

The Contractor shall provide a continuous paved walkway around all School buildings of minimum 2000mm width, with increased width at points of entry where user numbers increase. This pathway shall be coordinated with external paved areas developed as external learning environments.

Footpaths shall include an isolation joint between the footpath and the buildings to cater for differential movement and to prevent water ingress. The upper edge of the joint shall be sealed with silicon sealant – colour to match the pavement colour. The footpath surface shall grade away from the buildings.

Wheelchair and pram ramps shall be provided at kerbs to meet all access requirements.

Pavements shall not be constructed of loose granular materials (e.g. gravel or sand).

3.3.5. Hard Courts

External hard courts shall deliver a flat, safe, resilient playing surface for running team games. The surface shall be free from trip hazards and resistant to slipping. Hard courts shall be constructed of asphalt or concrete with a Plexipave-type coating and with an effective and durable edge restraint extending for the full depth of the pavement including base course. The edge restraint shall be set flush with the top of the hard-court surfacing. The selection of a pavement material shall be based on an assessment of the ground conditions and predicted seasonal ground movement behaviour at the Site.

Surface grades of the hard court shall direct stormwater runoff to the edges of the paved area without affecting the functional use of the hard court, in accordance with relevant design guidelines. Ponding of stormwater on the hard court is not acceptable. Land and pavements surrounding the hardcourt shall be graded to direct storm water and irrigation water away from the hardcourt surface. Positive drainage systems at the boundary shall capture and convey runoff away from the hard-court area. Hard courts shall be bounded by a subsoil drainage system that will isolate the hard-court foundation material from subsoil seepage and the effects of seasonal ground movement.

The Plexipave surfacing shall be line marked, in multiple colours, to support the range of court games played at the relevant sector of the School (Primary, High, College or Specialist).

3.3.6. Recycled Pavement Materials

Subject to the provisions of clause 1.11.2, recycled concrete aggregate and asphalt may, where feasible, be specified for pavement design and construction and shall comply with the requirements of the Specification for Supply of Recycled Material for Pavements, Earthworks and Drainage – issued by the NSW Department of Environment, Climate Change and Water).

3.3.7. Expansive Subgrade

Where the subgrade material is classed as expansive (high swell potential), the pavement design shall take into consideration the requirements of the TCCS Design Standards and Standard Specification for Urban Infrastructure Works and referenced standards.

3.3.8. Vehicle Paved Area Materials

Asphalt Pavement

Asphalt pavements shall be heavy duty with appropriate base course and sub-base material placement and finishing to meet design life requirements and in accordance with local Authority requirements, Austroads guidelines and the TCCS Codes of Practice, Design Standards and Standard Specification for Urban Infrastructure Works, and Standard Drawings.

Concrete Pavement

Concrete pavements shall be of a thickness and with appropriate reinforcement and base course material to meet design life requirements. Designs shall conform to Territory requirements, and Cement Concrete & Aggregates Australia guidelines. The surface texture shall be appropriate for intended use of concrete pavement and to ensure safe passage of pedestrians and vehicles.

Segmental Pavers

Segmental pavers shall be heavy duty with appropriate base course material to meet design life requirements. Pavement shall be placed to eliminate ponding and trip hazards arising from uneven settlement of bedding material.

Pavement Ancillaries

All pavements shall have appropriate concrete edge restraints such as kerb and channel or edge strip. Where disability access is required appropriate kerbing and channel combinations, along with pavement shaping, shall be adopted.

Appropriate subsoil (agricultural) drainage pipes shall be used to avoid pavement failure due to water infiltration. In situations where there is expansive subgrade, the subsoil drainage pipes shall not be permitted to come into contact with the expansive subgrade material, and not less than 100mm of capping material shall be provided around the floor of the subsoil drainage trench.

Kerb and channel and subsoil drainage shall be designed and installed in accordance with local Authority requirements, Austroads guidelines and the TCCS Design Standards and Standard Specification for Urban Infrastructure Works, and Standard Drawings.

4. Structural Engineering

4.1. Design Criteria

The design shall be based on and appropriate to a detailed understanding of the geotechnical conditions and terrain category at the Site.

The work shall comply with all relevant Regulations, Primary Standards and Design Guides, including but not limited to the following:

Note: Should any conflict be noted between the referenced documents, drawings, site specific requirements or other project instructions, this shall be immediately brought to the attention of the PAP.

1. NCC- current version
2. WHS Act 2011
3. AS/NZS 1170.0: Structural Design Actions – General Principles
4. AS/NZS 1170.1: Structural Design Actions – Permanent, imposed and other actions
5. AS/NZS 1170.2: Structural Design Actions – Wind actions
6. AS/NZS 1170.4: Structural Design Actions – Earthquake actions in Australia
7. AS 1288: Glass in buildings– Selection and installation
8. AS/NZS 2312: Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
9. AS 3600: Concrete Structures
10. AS 3700: Masonry Structures
11. AS 4100: Steel Structures
12. 'Recommended Practice: Design Detailing of Precast Concrete' Concrete Institute of Australia

4.2. Design Life

All permanent structures shall be designed to have a minimum design life of 50 years.

Transportable buildings shall be designed to have a minimum design life of 25 years.

4.2.1 Substructure

Prior to the commencement of the Design Development Process, Site investigations shall be carried out to ascertain the relevant properties of the founding material for design and construction purposes.

Footing systems shall be designed to limit differential settlements to levels within Australian Standard requirements and recommendations. Articulation of the footing system shall be sufficient to prevent cracking or dislocation of building elements.

Floors shall be designed to support local increased loadings from machinery, document storage compactus units etc.

Where trees are planted closer than 20m to buildings, the Contractor shall install underground root barriers to prevent damage to the buildings.

4.2.2 Superstructure

The structural system shall reflect the building plan and align with the most appropriate foundation system. The structure shall address the briefed requirements for future flexibility of building function and floor plan layout by, where possible, providing clear internal spans to allow future internal re-planning.

Load-bearing structures and the external envelope of buildings shall be of a durability aligned with the nominated design life so as to ensure an efficient use of materials, labour and energy.

The Contractor shall use materials and forms of construction that:

- use re-generable materials, from sustainable sources
- use building elements that serve the passive or active harnessing of solar energy
- have minimal embodied energy content
- afford the maximum recyclability at end of life of the School

4.2.3 Deflection

Structures shall be designed so that deflections, vibrations and resonances do not adversely affect the performance, serviceability, stability or appearance of the structure, facility services, equipment, applied finishes or secondary construction such as partition walls. Deflections shall be within tolerances set down by the Australian Standards. Specifically, the in-service deflections of structure supporting operable walls shall not exceed 5mm or span/1000 whichever is less.

Where there is a possibility of wind or machine induced vibration structural elements (such as floors, walls and roofs) shall be designed to withstand the loadings and movements without adversely affecting the buildings use or the experience of Users.

4.3. Maintenance Access

The structure shall be designed to facilitate safe access required for the performance of maintenance procedures on systems and equipment items within the School.

4.4. Gymnasium/General Purpose Halls

All surfaces shall be capable of withstanding a horizontal impact of 0.75 kN.

Walls shall be capable of providing adequate support for basketball backboard units, lateral restraint for fixed seating platforms, retractable seating and the like.

The ceiling and roof structure shall be capable of supporting a design distributed load on the roof structure calculated in accordance with clause 3.5 of AS 1170.1 (Structural Design Actions), and in locations where the structure is likely to attract a point loading due to hung equipment such as basketball backboard frames (which may also temporarily support additional imposed by sports players), climbing ropes or suspended sports nets, an assessment shall be carried out in accordance with AS 1170.1, clause 3.5.2.

5. Building Fabric

This section covers the requirements for each element of the building fabric of the School that the Contractor shall provide.

The School buildings shall be windproof, weatherproof, resistant to ingress by animals, birds and insects, efficient to operate, durable and adaptable and fit for the intended purpose.

The Contractor shall give due consideration to the extremes of the ACT climate and to the potential impacts that climate change may have on the building fabric (including increases in temperature extremes, increases in frequency of more intense rainstorms, and increases in wind velocity), and shall propose ways for the building fabric to be designed and constructed to mitigate such impacts. Resistance to air leakage (permeability) is a key factor for design and installation.

5.1. Warranty Periods – Building Fabric

The Contractor shall provide adequate warranty periods for each external fabric element. The table outlines the required minimum warranty periods for external fabric elements.

Table 4: Building fabric warranty periods

Building fabric element	Minimum warranty period
Precast concrete panels	20 years
Other wall panelling	20 years
Roofing	20 years
Façade systems and sealants	15 years
Alum windows including glazing	10 years
Anodising	10 years
Tanking and water proofing	20 years

5.2. Vermin Control

The School buildings shall be designed and constructed to:

- limit and control vermin access to the building interior, and to concealed spaces
- prevent vermin infestation, nesting and material damage to structure, linings and services
- prevent vermin infiltration to external luminaires, outdoor air intakes and services penetrations

Vermin includes rodents, marsupials, birds, small mammals and insects (such as moths, wasps, and termites).

5.2.1. Termite Protection

Termite protection shall comply with the relevant Australian Standard AS 3660.1 (as a minimum) and additionally with authority requirements where required. Termite protection shall be provided to all buildings comprising a complete physical barrier placed under concrete slabs, foundations and protecting cavity walls and framed projecting walls to the building perimeter. Where elevated and framed timber floors are used, the Contractor shall document a compliant physical termite barrier. Unavoidable penetrations such as service pipes, cable conduits and the like shall be sealed in accordance with the barrier manufacturer's installation instructions.

Chemical barriers and sprayed poisons are not approved for use.

5.2.2 Bird Proofing

The Contractor shall limit or eliminate ledges and bird perches at external eaves and under-croft areas. Bird deterrent treatment shall be provided at locations where birds can perch. In particular, eliminate bird perches which may result in birds defecating onto students' play, external eating or activity areas.

5.3. Roof

The Contractor shall provide all required roofing and roof plumbing fully integrated with adjacent work, including fixings, trims, flashings, sealants, and finishes, including gutters, downpipes, insulation sarking, and safety mesh. All roofing shall be of profiled coated metal sheets in single lengths wherever possible, with a minimum slope of five degrees. Roofing materials other than metal sheets (including cement or clay fired roofing tiles) shall not be used unless the Territory has given specific approval.

Parapet walls are not to be part of the roof design. Daylight may be admitted to central building areas using roof lights (comprising a raised roof area with vertical windows), but proprietary skylights inserted into the roof cladding are not to be used.

The Contractor shall provide durable folded metal flashings and/or capping at roof junctions, upstands, abutments, and penetrations through the roof. Flashings around roof penetrations shall be continued upslope to the ridgeline. Gooseneck type flashings shall be provided at cable and small pipe penetrations. Flashings shall match the adjacent roofing material. The Contractor is not permitted to use of silicone sealant as the primary water seal for flashing locations.

The design for rainwater catchment and discharge at the Site shall be coordinated with the ESD strategy for rainwater harvesting and re-use. Refer Section 8 (ESD and Energy Efficiency).

Consideration shall be given to longevity when selecting roofing, roof profiles, fixing systems and roof plumbing materials. The exposure severity category for the Site shall be determined, giving consideration to local risks of corrosion from environmental or industrial sources.

Storm loadings on roof catchment areas and likely impact on guttering and roof drainage systems shall be calculated and allowed for, giving due consideration to recent trends of more frequent and severe rainstorms and hailstorms. All roof areas shall project a minimum 600mm beyond the finished line of the external walls below and finish at exposed fascia gutters (not concealed or box gutters), so that if gutters overflow, stormwater cannot enter the wall cavity or the building interior.

The Contractor shall provide a roofing system of low maintenance to avoid future disruption to the School.

The design of the School shall as a minimum provide a roofing system and associated work that:

- is complete, windproof, weatherproof, possum, bird and vermin proof
- remains intact and weatherproof under the local and regional ambient and seasonal climatic conditions
- accommodates the wind loads applicable to the Site
- provides adequate means of dealing with vapour pressure, condensation, corrosion and thermal movement
- is light in colour if appropriate for the surrounding environment to reduce summer overheating
- accommodates all short and long-term movements and deflections
- supports the specific imposed loads and types of roof access without visible damage or impairment of performance

- does not emit airborne fibres or dust
- ensures that adjacent materials and products are chemically and electrolytically compatible and/or appropriately separated to avoid galvanic reactions with each other, substrates, and adjacent work. Adjacent materials and products, including adhesives and sealants, shall not stain or contaminate, and shall not cause visual or structural defects in adjacent materials
- incorporates all necessary provisions for code compliant safe roof access including access ways, safety railings, ladder brackets, safety anchor joints, fall arrestor systems and the like and shall be capable of supporting such loads without damage or distortion, failure of fixings, or loss of watertightness
- provides vertical highlight glazing above roofs (where used) utilising materials that have strength and durability suited to the exposure conditions, are installed to eliminate the risks of leaks, and are provided with safe means of access (for cleaning and maintenance) and measures for the control of solar heat gain and glare
- excludes polycarbonate or fibreglass domed roof lights
- provide water-tight roof penetrations for cables and pipes, where applicable, which are located near the ridge or similar high point of the roof and incorporate UV stabilised gooseneck covers
- is designed to eliminate climbing or stepping points that may assist unauthorised access to roofs
- prevents the level of rain noise from exceeding the levels set out in Section 15 (Acoustics Engineering)
- includes additional acoustic insulation in roofs for a school that is impacted by proximity to aircraft flight paths
- allows for the discharge of all water and moisture, including leakage and condensation, outside the line of the eave edge and into the drainage system
- provides for emergency overflow and relief systems to prevent flooding in the event of blockage or malfunction
- minimises heat gain or loss from outside
- does not incorporate downpipes that descend within any internal areas. Downpipes shall not be off set in ceiling areas
- avoids the need for any internal box gutters or valley gutters
- incorporates appropriately located and sized sump and overflow spout systems

The Territory will not accept habitable rooms located beneath tanked flat concrete slabs.

5.3.1 Rainwater Goods

Stormwater guttering shall be robust and securely fixed and be capable of withstanding accidental damage (e.g. from ladders) during maintenance works. The height of guttering from paving or garden areas shall not be less than 2700mm.

The Contractor shall consider the future difficulties of replacing sections of guttering formed to custom profiles. Where possible, the Contractor shall utilise standard commercially available gutter profiles that provide the required capacity, and gutters shall be installed in longest continuous lengths possible.

Rainwater gutters and downpipes shall be sized to deal with calculated 1:100 year stormwater catchment. Where roof areas are used as catchment for recycled water, down pipes shall be fitted with “first flush” type debris diverter.

Guttering shall be constructed to prevent accidental blockages, and to direct storm overflow and “first flush” discharge away from doorways and pedestrian paths. Where trees are planted closer than 20m to buildings, the Contractor shall install gutter guards and to prevent blockage to gutters and damage to buildings.

Rainwater downpipes shall be a minimum of 150mm diameter with detailing and arrangements that discourage unauthorised access to roof areas. Downpipes shall be installed with physical protection up to 2.0m above pavement level so that the downpipe material is not vulnerable to vandalism through being kicked or otherwise crushed. Downpipes shall be located in protected areas away from heavy student traffic. Downpipes shall be installed exposed against external walls or posts and restrained with fixing brackets. Downpipes shall not be concealed behind wall cladding materials or concealed within eave spaces. Each downpipe shall stop 75mm above the grated spigot upstand of the stormwater drain line to facilitate maintenance and permit clean out of blockages.

Where rainwater goods are replaced or extended during the course of the Operating Phase, such works shall be identical in design and appearance to the original installation.

5.4. Roof Access Hatches

The Contractor shall provide roof access doors and hatches including ladders and stairs to be designed to satisfy relevant WHS Standards. Doors shall be to AS 2688. Doors or roof access hatches shall be lockable. Roof access hatches to be sliding type hatches. Access to be via stairs not ladders. Safety labels shall be applied.

5.5. Fall Prevention

The Contractor shall provide a suitable safe access and fall protection system for all roofs and ensure conformity with the WorkCover NSW code of practice “Safe Work on Roofs – Part 1: Commercial and Industrial Buildings.”

The design and installation shall address all areas of roofing including access points, plant and equipment, gutter maintenance and skylights. The Contractor shall equip the School with a safe access harness kit (bagged and labelled) configured to suit the installed fall protection system.

5.6. Roof Mounted Plant Platforms

Where roof mounted plant is proposed, the Contractor shall provide level galvanised structural steel framed platforms, with support legs oriented to bear onto structural walls or columns below. The roof cladding shall not be the support surface for plant loadings. The platform framing shall provide direct support beams beneath items of plant and equipment, plus a general grated galvanised mesh floor to create a safe work environment for service and maintenance tasks. The plant platform shall be bounded by safety rails, and metal screens. Access to the plant platform shall be by a safe access walkway (specified elsewhere in this section).

The Contractor shall consolidate roof mounted plant so that the number of plant platforms is kept to a minimum. Plant platforms are to be placed in zones that afford maximum screening from view (not generally distributed around a roof area), and platforms shall be placed at the top end of roof slopes (away from risk of theft or vandalism).

5.7. Walkways

Where the design requires regular roof access for maintenance and repair of roof mounted plant and equipment, the Contractor shall provide a proprietary grated aluminium walkway assembly with a clear width minimum 900 mm, and metal handrails where the walkway is mounted more than 600 mm above roof or is adjacent to a fall hazard.

5.8. External Walls and Cladding

The Contractor shall provide all required cladding, including all finishes, fixings, sealants, flashings and trims and these shall be suitable for its location and the intended function. The cladding system shall provide an acceptable level of maintenance to reduce future disruption to the School.

Consideration shall be given to longevity when selecting walling and cladding materials. The exposure severity category for the Site shall be determined, giving consideration to local risks of corrosion from environmental or industrial sources.

The design of the School shall as a minimum provide a cladding system and all associated works that:

- is watertight, and windproof
- is robust, durable, and suitable for long term performance in high exposure conditions
- includes masonry facing up to 2100mm above floor level
- accommodates all permanent and temporary loads
- prevents and resists corrosion
- ensures that adjacent materials and products are chemically and electrolytically compatible with each other, substrates and adjacent work. Adjacent materials and products, including adhesives and sealants shall not stain or contaminate and shall not cause visual or structural defects in adjacent materials
- meet the minimum required levels of external noise ingress as detailed in Section 15 (Acoustics Engineering)
- discharges all water and moisture, including leakage and condensation into the drainage system
- minimises heat gain or loss from outside
- minimises air leakage / infiltration into the building
- functions noiselessly under all conditions including substrate movements, temperature changes, wind, maintenance and cleaning operations
- provides continuous electrical conductivity within the framing for connection to the lightning protection system
- prevents access by, and does not provide concealed breeding places for vermin
- does not require painting
- does not enable the growth of algae, mould or fungus
- enables the removal of graffiti with minimal damage to the appearance and finish of the substrate and no damage to the durability of this material

Wall cladding materials shall provide:

- long term durability
- resistance to vandalism damage
- an appropriate level of insulation to achieve the minimum acoustic and thermal performance requirements as detailed in Section 15 (Acoustics Engineering)

The permeability and transparency of the external walls and/or associated fenestrations towards light, heat and air, shall be controllable and capable of modification, so that it can be modified according to local climatic

conditions (solar screening, protection against glare, light deflection, shading, and adjustable natural ventilation).

5.9. Insulation and Barriers

The Contractor shall incorporate suitable insulation to roofing and walling to provide a continuous thermal and vapour barrier suitably selected and installed for the conditions and performance requirements, including NCC Section J.

The design of the School buildings shall as a minimum provide for insulation and barriers and all associated works that:

- provide thermal insulation to roofing and cladding including over concrete roofs, acoustic insulation to roofing and cladding, sarking and vapour barriers
- ensures that all sarking vapour barriers are properly lapped and taped in order to limit drafts and vapour penetration
- ensures that where bulk insulation is used, it is of a suitable type, selected for the conditions and performance requirements
- ensures that where bulk insulation is used, it complies with relevant WHS Legislation, Policies and Guidelines and current accepted industry practice with respect to airborne fibres
- where reflective foil is used, it shall be suitable reinforced aluminium foil, suitable for the location and the intended function
- enables the sound insulation between spaces acoustic performance requirements to be achieved as detailed in Section 15 (Acoustics Engineering)
- has minimum total [R values] sufficient to achieve the energy performance requirements set in Section 8 (ESD and Energy Efficiency)

Where internal walls face onto covered breezeways that are open at both ends, they too shall be insulated as for external walls.

5.9.1 Floor Insulation

Floor insulation shall have minimum total R values sufficient to achieve the energy performance requirements set in Section 8, ESD and Energy Efficiency.

Irrespective of NCC requirements, provide insulation to vertical external edges of slab-on-ground edge beams using a proprietary insulation board. Coordinate the insulation board with the mechanical termite protection installation.

5.9.2 Exposed Roof Insulation

In situations where there is no ceiling lining to conceal the roof insulation (this is limited to internal gymnasium sports halls/ general purpose halls, external technology learning areas (where provided), and internal storerooms (materials technology, school bulk store, sports equipment store and ground equipment store), a layer of perforated white polythene coated foil shall be provided as an outer facing to the visible underside (in addition to foil facing of the insulation blanket).

5.10. Internal Walls

Where used, timber framed walls shall be termite treated and constructed in accordance with the relevant Australian Standard. Provide additional noggings as support for fixtures, hardware, etc. and where required for fixing wall linings.

5.11. Ceilings

The Contractor shall provide a ceiling to every space or room (unless noted otherwise), with the ceiling construction and finish consistent with the function and use of the space or room. Return ceiling linings into cupboards, reveals, recess, niches and the like. Ceilings and ceiling installations shall be durable, serviceable, require the minimum in periodic maintenance, and be resistant to vandalism, impact damage and moisture vapour (where applicable).

The minimum finished ceiling height in any area shall be 2700mm measured from finished floor level (or raised platform level if applicable) and may need to be higher in locations where suspended ceiling fans are installed. If exposed grid ceilings are used, they shall be at a height that will be out of reach of students standing on chairs and tables. Services bulkheads (where provided) shall be adjacent to a wall, shall not drop below 2400mm (measured from finished floor level) and shall not exceed 5% of the floor area of the space in which they occur.

Flush painted plaster ceilings shall be provided in storerooms, service rooms, student toilets, kitchens and change rooms. Flush painted plaster shall be used to encase bulkheads below 2700mm ceiling height. Ceilings shall be constructed to deliver required fire ratings where specified in the Functional Brief or in this Technical Specification.

Ceiling installations shall assist in the management of the acoustic performance of the space, including moderating reverberation within a space, and controlling acoustic isolation of a space by controlling noise leakage and noise intrusion.

Perforated Colorbond finish custom orb and mini-orb profile sheet steel is identified as a suitable ceiling cladding for high noise and/or impact prone student areas such as learning neighbourhoods, science and technology areas, art and design studios, school halls and gymnasiums.

Ceilings shall provide light reflection unless this is inconsistent with the function of the space.

Suspended ceilings, where provided, shall:

- be braced against lateral movement and uplift
- not attach the suspension system to the lip of purlins
- provide space for support members as required by the loads on the system and the type of ceiling
- allow for the installation of services and accessories, including ductwork, light fittings and diffusers and provide additional back support or suspension members for the fixing of such items
- incorporate accessories including hatches and curtain tracks
- set out tiles so that opposite margins are equal
- set out patterned or heavily textured materials to give consistency in direction of pattern or texture
- provide special sized purpose-made panels to fill non-standard margins, openings and penetrations

External eaves and building projections shall be fitted with eaves linings that are durable, serviceable, require the minimum in periodic maintenance, and be resistant to vandalism, impact damage and exposure to ACT ambient conditions.

5.11.1 Ceiling Access Hatches

Ceiling access panels shall not be located in areas generally accessible to students (such as Learning Neighbourhoods, toilets, corridors, etc.) Where it is necessary to provide access through ceilings to ceiling spaces, access hatches shall be installed which:

- are of a material that matches the adjacent ceiling in appearance and colour
- are fitted with a security latch
- have a surface which is flush with the ceiling surface

5.12. Windows

The Contractor shall provide external windows and internal glazed screens to meet the required performance standards and the requirements of applicable codes. All external windows shall be installed to ensure that the external façade is weatherproof.

The design of the School shall, as a minimum, incorporate windows and window systems and all associated works that:

- are installed to be weatherproof and exclude water and moisture from entering the inside of the School in all weather and rain-fall conditions. The window installation shall include glass and glazing accessories suitable for the location and the intended function and accommodate the wind loads applicable to the Site
- have glass thicknesses and safety glass materials appropriate to the glass area, safety risk, exposure to risks of vandalism and breakage, performance requirements and conditions, including wind loads and internal air pressures, deflections and safety
- have all glass panels set into full perimeter frames (including full framed glass louvres)
- accommodate all permanent and temporary loads (including human impact, wind, earthquake, maintenance and service loads as applicable), individually and in combination, without failure, damage (including cracking, distortion, looseness, dislodgement, or visible movement at any joint) to adjacent or applied work, or risk to human safety
- remain stable without excessive deflection, and without damage or rattling under normal conditions of use
- allow thermal movement to take place freely in the plane of the glazing system, and does not cause stressing or induced loading in the installed work, or buckling, failure of joints or other damage;
- are corrosion-resistant
- ensure that adjacent materials and products are chemically and electrolytically compatible with each other, substrates, and adjacent work, or are separated by suitable spacers. Adjacent materials and products, including adhesives and sealants, shall not stain or contaminate, and shall not cause visual or structural defects in adjacent materials
- allow the discharge of water and moisture, including leakage and condensation, outside the building and into the drainage system
- do not permit direct sunlight to penetrate windows during core hours during summer and for 1.5 months either side of the defined summer season
- provide adequate ventilation, noting the requirement for ventilation (functional use or for emergency conditions only) in the Mechanical Ventilation section

- be appropriately shaded during summer and shoulder seasons through means of external fixed sun-shading devices and systems to suit the orientation, view opportunities and size of the window being shaded. The use of solar films on their own is not seen as an appropriate response to the issue of sun protection

The Contractor shall ensure that any operable windows (including high level/ clerestory windows) are:

- able to be manually operated by a standing adult without resort to ladders or platforms
- fitted with a means of securely limiting the window opening
- robust and vandal-resistant from external unauthorised entry
- fitted with locks keyed to a master key system
- designed to prevent the unauthorised removal of the window sash
- fitted with flyscreens
- fitted to prevent the risk of children falling or climbing in or out of the window
- not hazardous to persons passing by windows internally or externally when in use

Levels of natural and artificial lighting shall comply with the requirements as detailed in Section 8 (ESD and Energy Efficiency).

The thermal performance of glazed elements shall be sufficient to achieve the energy performance requirements set in Section 8 (ESD and Energy Efficiency).

Windows shall be fitted with internal blinds that cover the full extent of the glazing for glare control and lock down / lock out modes. In selection of internal blinds or shade solutions, consider the impact on exterior views from within the building. Roller blinds with metal components and other robust systems with few moving parts are preferred. Internal blinds shall be specified in accordance with overall façade performance, including glazing, sun shading and room activities. Internal blinds shall be dual blinds with one blind translucent and the other blackout and shall be heavy-duty roller type blinds which are vandal resistant.

Looped cord and/or chain controllers pose a safety risk to children under 5 years. Any exposed looped cord, continuous looped bead chain or other flexible looped device shall be at least 1600mm above the floor when the blind is in its lowered position and shall be securely fixed against the wall.

Where internal glazed screens are provided, consideration shall be given to the size and configuration of screens. Full height screens in partition walls assist with daylight sharing and supervision but constrain the use of walls. Apart from narrow full height sidelights to doors, it is generally preferred that internal windows be installed above a nominal chair rail height, with framed and lined partition walls below. This arrangement allows for visual connectivity between spaces, while maintaining valuable wall space below the windowsill.

The HVAC systems shall be designed to provide mechanical ventilation to all occupied areas hence external windows do not need to be operable, for the purposes of functional ventilation. However, in each teaching space, at least one operable window (two in large spaces for cross ventilation) shall be provided for the purposes of emergency ventilation, should the HVAC system fail. Such windows shall only be operable with a special key. These windows will require safety features to prevent pupils from falling through at heights, however they do not require insect mesh or security mesh. All operable windows shall have reed switches monitored through the security alarm system, to alert staff at the time of setting up the alarm, if windows have been left open.

Window schedules shall include details of weather seals, roller blinds, safety and security measures.

5.13. Doors

The Contractor shall as a minimum provide doors / door hardware and all associated works that:

- are able to cope with heavy and constant usage without failure or sagging
- maintain good quality finish, structure and appearance under heavy and constant use
- prevent impact to adjoining surfaces
- are simple and convenient to use for all users regardless of capability
- are designed for their intended purpose and users and sized to meet the anticipated frequency of staff, student and deliveries access into and within each building

Doors shall have a minimum clear opening of 2040mm measured from threshold or floor level to the lowest point of frame or hardware measured at the head of the opening. Hardware such as closer cases mounted to the head of the door frame shall not project into the 2040mm clear opening.

Provide alternative door configurations (including auto sliding doors, double doors, cat and kitten doors, operable glazed screens, metal roller shutters, sliding panels, panel-fold doors or glazed doors, etc.) to suit the functional requirement of the space where the door is located or to support educational design principles. In Kindergartens, Pre-Schools and Early Learning Centres, consider the use of two leaf stable door arrangements to permit staff supervision of adjacent spaces while safely containing younger children.

The door/door hinge frame junction shall have flexible guards installed between the hinge side of door panels and the door frame, to protect against finger injuries.

5.13.1 External Doors

With the exception of sideways sliding manual or automatic doors, all external doors shall open in the outwards direction. The Contractor shall provide external doors which possess the following qualities:

- are weatherproof and are protected from climatic influences, including strong winds, penetrating rain, and rainwater dripping from the surrounding wall linings
- have heavy duty self-closers
- are sufficiently robust to provide appropriate security to the building and to withstand high wind conditions without any stress or damage to the door, glazing or hinges
- provide adequate space for hand operation of locks, snibs and handles without risk of injury
- have locks keyed to an approved master-key system
- are fire rated or smoke sealed where required
- have heavy-duty seals to prevent ingress of rainwater, wind, dust and debris
- are provided with internal and external mat wells and floor mats at all entrances
- include fittings such as door handles and push/pull handles that are appropriate to the student population
- are not of timber construction or faced with timber materials
- if it is a *required exit*, it shall be a single-action opening door, operable from the inside
- are of low maintenance to prevent disruption to the School
- Are fitted with reed switches (reporting to the BMS that can detect that the door has been opened and will then initiate temporary shutdown of heating or cooling in the adjacent interior space)

Entry and exit doors that are subject to continual heavy use shall be constructed for strength and resilience against wear, and against accidental and deliberate damage. Glazed doors shall have at least one cross rail to stiffen the door and to reduce the size of glass panels. Doors shall be fitted with heavy-duty self-closers with the capacity to close and latch the door without slamming and to retain the door against wind gusts, however doors shall be operable by any User that can be expected to be at the School.

External door schedules shall include details of self-closers and weather seals.

Any air grilles in external doors shall be fabricated steel louvres or aluminium louvres installed direct to door frames. The use of light weight internal quality air relief grilles on external doors is not permitted.

5.13.2 Automatically Operating Doors

The Contractor shall provide external entry to the reception lobby via a paired set of automatic operating glazed sliding doors, forming a wind lock. The lobby space shall be suitably sized, and the automatic doors offset sufficiently, so that a single user will not activate both doors at the same time.

Automatic doors shall be complete with all necessary hardware and accessories, including:

- movement sensors which are not affected by drift or indefinite cut off points
- a failsafe device to open doors on power failure is not required
- good quality, heavy-duty proprietary door seals, including edge and butt seals
- auto doors to be capable of locking closed by control switch
- adjustable dwell time for door operation (including the option for a winter setting – reduced door opening width)

The reception lobby shall also be provided with a single hinged person access door (additional to the wind lock doors) to facilitate simple access out of hours. The access card reader shall be associated with the person access door to permit external after hours release by electronic key system. The person access door shall also have an internal after-hours release button (mushroom cap push button door release).

The mode of operation of automatic doors, especially when they affect access to the FIP, shall be discussed with ACT F&RS and the Territory. Typically, external doors are required to fail safe (i.e. remain closed), unless opened through authorised means, and then to automatically close.

5.13.3 Internal Doors

Where required, the Contractor shall provide internal doors which possess the following qualities:

- shall be solid core to deliver required durability and acoustic isolation
- shall be fire rated flush panel door in steel frame (with fire/smoke seals and fire rated door hardware) where required as part of a fire rated room or compartment (e.g.: Secure Store)
- shall provide adequate sound reduction for the intended usage as detailed in Section 15 (Acoustic Engineering)
- (where a general passage door) shall be operable without requiring power assistance for young/disabled person
- Door stops shall incorporate door hold open devices, unless they are fire doors
- Temperature controlled rooms (such as the Computer Room) shall have heavy duty self-closers installed and signs 'Temperature Controlled Room, Keep Shut', applied to both sides

To assist users to identify points of access, internal room entry doors shall be painted in a contrast colour to walls. Doors to storage cupboards and service rooms shall be painted similar to the wall colour.

Glass viewing panels shall be installed in internal doors where two-way traffic is expected, and where staff may need to check the occupancy and activities in a room but whilst maintaining some element of privacy. The glazed panel shall suit student eyeline when doors are used by students but shall not continue lower than 800mm above floor level. The viewing panel in a flush panel door can be omitted if there is a glazed sidelight or internal window beside the door. Locations where viewing panels are required include:

- School principal's offices
- senior personnel offices
- distributed staff offices
- business manager's offices
- conference and meeting rooms
- general office
- airlocks and lobbies
- interview rooms
- specialist consulting rooms;
- first aid rooms
- general teaching and learning areas where spaces are accessed via a hinged or sliding door

Air transfer grilles shall not be installed to any internal doors due to risks of vandalism, privacy and compromising the required acoustic isolation or fire rating of a space. The preferred option is ducted air transfer grilles at high level.

The door connecting the School reception area with the school internal circulation network shall be a security door with electric strike, controlled by release button from the general office and by key. The door shall have internal after-hours release button (mushroom cap push button door release).

5.14. Door and Window Hardware and Keying

The Contractor shall provide all door, window and other finishing hardware and related items necessary to operate the School.

Without limitation, hardware shall include hinges, pivots, locks, latches, push/pull plates, padlocks to gates and enclosures, master key systems, door furniture, door closers, door stops, window latches and locks, weather seals, acoustic seals, fire and smoke seals, and other hardware required to provide the required functionality and security to the School. Inactive leaves on double doors shall be secured by top and bottom bolts.

The Contractor shall select hardware and metalwork items with regard to the availability of that particular product over the duration of the Facility Maintenance Term and to ensure visual consistency throughout the School when installed and replaced.

5.14.1 Outline Scope of Secure Locking

The Contractor shall provide keyed locking for security to all external doors, secure cages around external plant and equipment, gates, and generally to internal doors across the School where the privacy or security of the room/space function or the room/space contents requires protection and keyed access control. These internal spaces include:

- all private offices, shared staff workrooms, the general office, library workroom, interview and conference rooms, etc.
- doors that form boundaries to zones that can be isolated for Out of Hours Use or isolated for zoned and controlled access during Core Hours and Extended Hours
- secure stores, storage rooms, sports store, cleaner's stores, music stores, electrical and mechanical switch rooms, communications rooms and cupboards, electrical DB cupboards, service cupboards, plant rooms, etc.
- rooms/ spaces that contain expensive equipment or dangerous equipment or where unsupervised access is not permitted (including rooms containing computers, music rooms, materials technology rooms, instrument rehearsal rooms, science laboratories and science prep rooms; the gymnasium hall, the theatrette, etc.
- rooms/spaces where in-progress or completed student creative work (in all configurations of 2D and 3D work) might need to be secured
- the canteen, food storerooms, pantries, etc.
- rooms/ spaces that may contain valuables or controlled substances (e.g. the first aid room, chemical storerooms, etc.)
- storage cupboards and secure drawers in rooms (keyed alike within a room only)

TCCS is responsible for the preparation and issue of master keyed cylinders and keys for the Territory's schools. The Contractor shall coordinate with TCCS during the construction phase to ensure the timely provision of the required security hardware. The Contractor shall provide TCCS with plans and door schedules, confirming the number of locked doors and other locks for the Project, and the locking configuration in each case. The Contractor shall coordinate input from the EDU Project Officer and TCCS, so that an agreed master key hierarchy can be developed.

Communication racks are keyed to the SSICT keying system – refer Section 12.2.

Key codes shall be arranged under a master key hierarchy that separates key paths according to access for School use and access for the Maintenance Contractor's use, and that controls key access to particular locations and purposes. The master key hierarchy shall limit and contain the risk of re-keying if any single key (excluding a master key) is lost.

The Contractor shall use temporary cylinders during the construction phase. The temporary cylinders shall be removed and replaced with permanent TCCS issued cylinders immediately prior to handover.

5.14.2 Hardware Requirements

The design of the School shall take into account the door and window hardware and keying requirements and be suitably selected and installed for the conditions and performance requirements including:

- ensuring all door and window hardware shall be of appropriate size, height, materials and fixing for its application and usage
- providing a keying system that is capable of accommodating any future expansion and where possible, does not require the replacement of existing locks

The Contractor shall as a minimum provide all doors and windows hardware and all associated work that:

- is robust and heavy duty
- is suitable for a school environment
- is suitable for the location and the intended function of the doors

- is suitable for the mass of the doors
- is corrosion-resistant or protective coated to prevent corrosion
- Door handles must not be climbable

The Contractor shall as a minimum provide a physical key lock system to doors that meets the following requirements:

- locking hardware can accept cylinders issued by TCCS
- the cylinders and handles are appropriately mounted to allow for particular requirements such as childcare areas
- keys are fitted with identification tags
- keys and key lock cylinders are stamped with the key codes

Lever handles shall not be relied on as door pulls in conditions of continual heavy use. Where it is possible for a hinged entry/ exit door to be unlatched during the day, push/ pull plates in addition to other hardware shall be provided. Closers shall be fitted to these doors to resist negative pressure from external wind loads, and to limit the loss of conditioned air from building interiors.

Doors that are designated external escape doors, but which are normally closed and latched (e.g.: doors leading directly outdoors from the gym hall), shall be fitted with emergency push bars to facilitate egress.

The locks to all external doors and to internal doors that serve enclosed offices, meeting rooms and teaching spaces, shall be configured to support the ACT Education and Training Directorate's lockdown requirements - thereby controlling unauthorised access and permitting school students and staff to shelter in secure locations.

5.14.3. Electronic Access Control System

The Contractor shall:

- install a system that provides internal and external access pass readers at the main entry door(s) to the School Administration reception and the General-Purpose Hall, and to at least one entry door to each Learning Community area, and to external access/ egress doors and internal lockable doors that form boundaries to zones that can be isolated for Out of Hours Use
- design the system so that (in the event of a power failure) door locking fails to lock (secure) mode (for example to maintain security in the event of a lockdown), but with internal mushroom cap door release buttons adjacent to each controlled door (with the release function supported by battery back-up)
- install a system that extends access control coverage to car park entry, including the provision of boom gates at car park entries, if provided
- install a system that extends access control coverage to vertical transportation if provided
- provide the School with the technology and equipment required to code and issue programmable proximity access passes (cards or fobs) to approved personnel
- ensure that the key card system is secure and cannot be copied by individuals

5.14.4. Kick Plates

Kickplates to both sides of flush panel doors shall be provided where the door is at risk of damage. Kickplates to be Type 304 satin finish stainless steel kickplates, 300mm high x width of door. Kickplates shall be glued and screwed to the door lining.

5.14.5. Door Stops

Door stops shall be provided to prevent doors or door furniture striking adjacent walls, fixtures or other surfaces.

5.14.6. Door Hold Open devices

Door hold open devices shall be integrated with door stops for all doors that have self-closers except on doors that are through fire corridors and exits. Where required, fire doors shall have magnetic door open devices connected to the fire detection system.

5.15. Operable and Adaptable Walls

Operable walls are not considered best practice in Learning spaces in the ACT and should not be considered for these areas, see *EDIS – Introduction* and *relevant Functional Brief*. Where proprietary acoustic operable walls or adaptable screens are proposed in other areas as part of the Contractor's design solution, the Contractor shall provide these elements complete with all necessary support framing, fixings, seals, finishes, hardware and trim that is suitably selected and installed to be functionally fit for purpose. Surfacing materials used on door panels shall be durable and suited to repeated stacking and un-stacking of the panels.

Where necessary, a pass door within the operable wall shall be provided to facilitate access to a contained space. Operable walls shall have an acoustic performance rating to match adjoining partition systems as detailed in Section 15 (Acoustic Engineering).

Operable walls shall be of a design that permits simple operation (including stacking panels and operation of door seals) by one or two adults.

Where operable walls are installed in the external façade of the building, to permit the connection of indoor and outdoor learning spaces, the operable wall shall meet the following requirements:

- includes structural support framing sufficient for the size and weight of the door panel
- provides a complete seal against wind, rain and wind-blown dust and debris when closed
- includes bolts and locking to form a secure lockable barrier when closed, resistant to unauthorised entry
- is of robust construction and incorporates a smooth-running overhead track
- easy and convenient for unassisted single user operation

5.16. Roller Shutter Doors

External roller shutter door shall comprise chain driven planetary geared drum roller and continuous pressed steel curtain fitted with nylon slide clips and steel tension strips, with chain drive (for doors up to 3.0m height) or with electric motor drive (for doors in excess of 3.0m height and/or 3 metres in width).

All metalwork shall be powdercoated over a galvanised steel substrate, including a suitable bonding primer.

The door assembly shall be complete with all equipment and fixings, guides, locking devices, weather seal at bottom rail, and steel corner guards at jamb openings.

The curtain in its closed position shall be capable of withstanding the positive or negative wind pressure (found at the Site) on the surface without impairment of the shutter's ability to function under ambient temperature.

5.17. Multi-panel Overhead Lift Doors

Where the Contractor proposes overhead lift doors, the door installation shall meet the following requirements:

- no risk of injury to adults or children when the door is being opened or closed. Guards shall be provided around all operating mechanisms below 2.1m height
- includes structural support framing sufficient for the size and weight of the door panel
- forms a secure lockable barrier when closed, resistant to unauthorised entry
- provides a complete seal against wind, rain and wind-blown dust and debris when closed
- easy and convenient for unassisted single user operation
- fitted with a reed switch (reporting to the BMS) that can detect that the door has been opened, and shall then initiate temporary shutdown of heating or cooling in the adjacent interior space
- where the door size or weight requires electric motor drive for opening and closing, the controls shall include an emergency stop button

5.18. Stairs and Ramps

The Contractor shall provide stairs and ramps that comply with the following requirements:

- widths, tread, riser dimensions, handrails, balustrades, kerbs, luminance contrasts, slip resistance and hazard tactile ground surface indicators to be provided which meet the minimum requirements of the relevant regulations and Australian Standards
- fire-isolated stairways and fire-isolated ramps shall be provided where required
- if handrails are required, two handrails at different heights shall be provided to suit comfortable use by adults and children in accordance to the conditions of use
- stair treads to have slip-resistant surface and a contrasting texture/colour at treads
- all walking surfaces to have safe gradients
- ramps shall be designed for safe and accessible wheelchair use in accordance with relevant regulations and Australian Standards

6. Building Finishes

The Contractor shall provide finishes that:

- meet the requirements of ESD strategy – refer Section 8 (ESD and Energy Efficiency)
- have appropriate acoustic and noise reduction capabilities in accordance with Section 15 (Acoustic Engineering)
- are of suitable colour schemes and contrasts
- are durable and resistant to exposure, weathering and general wear and tear and, where required, fire resistant

Where possible, the Contractor shall use finishes that:

- use regenerable materials, from sustainable sources
- have minimal embodied energy content
- afford the maximum recyclability at end of life of the School

External finishes shall be selected to suit the functional and service requirements of the School. External walls can be subject to abrasion and impact damage from play and sports activities, and durable materials shall be used.

6.1. Warranty Periods – Building Finishes

The Contractor shall provide adequate warranty periods for each building finish element. The table outlines the required minimum warranty periods for building finish elements.

Table 5: Building finish warranty periods

Building finish element	Minimum warranty period
Suspended ceilings	10 years
Hardware	5 years
Carpets and applied floor finishes	5 years
Lifts and vertical transportation	20 years

6.2. Masonry

Where the Contractor proposes to use masonry executed in clay brickwork or concrete blockwork as structural walls or wall claddings, materials, detailing and construction work shall comply with all relevant Australian Standards and the recommendations of the material manufacturers.

Masonry works shall include all associated mortar, lintels, ties, control joints, embedments, joint insertions, and sealants.

The design of the School shall as a minimum ensure that brickwork and blockwork:

- accommodates all permanent and temporary loads
- accommodates all short and long-term movements and deflections in the base-structure, or substrates to which the work is fixed, and within the work, including thermal movements, without failure or damage or the transfer of loads from the base-structure to the work of this section
- provides fire-resistant construction to adjacent and concealed work, where required for continuity

- is corrosion-resistant or protective coated to prevent corrosion
- provides suitable moisture-resistant materials and construction details
- ensures thermal insulation is integrated into the dry-wall framing
- prevents the formation of condensation on the inside surfaces of external cladding systems from warm humid air on cold surfaces by the correct selection and location of insulation and continuous vapour barriers as required
- provides acoustic construction as detailed in Section 15 (Acoustic Engineering)
- includes an anti-graffiti applied finish that allows the removal of graffiti without adverse impact on the durability or finish of the substrate material

6.3. Structural Steel Finishes

The Contractor as a minimum shall provide steel finishes and all associated work that meet the following requirements:

- are corrosion-resistant or coated to prevent corrosion
- the products and finish type ensure consistency of the finish
- the decorative coatings are to be UV stable and moisture-resistant
- an appropriate coating system is to be provided for the substrates, exposure, required finish and prevailing conditions
- finished surface quality shall be free of defects and smooth over each element, and shall have a consistent appearance over the entire work
- galvanizing shall be continuous, smooth and evenly distributed, and free from visual and surface defects including dip lines, lumps, blisters, gritty or uncoated areas, spots, dross or flux
- hot dip galvanizing visible in the installed location shall be carried out to architectural grade and have a uniform patina and texture over the entire visible surface without defects or rough patches
- where pre-coated materials are subject to on-site welding, cutting or similar work, the applied protective coating shall be repaired to deliver equal protection, equal durability and performance, and a visual appearance identical to the undamaged adjacent surfaces

6.4. Metalwork

The Contractor shall provide all required fabricated metalwork, including anchorages, fixings, finishes and trims and ensure that they are suitably selected and installed for the conditions and performance requirements.

The Contractor shall supply and install all metal work required for the Contractor's design and to deliver the required functionality, including:

- access platforms
- access walkways
- metal stairs and ladders
- pipe railings, bollards, balustrades, guardrails, handrails and grabrails
- metal fences, gates and equipment cages
- secure storage cages for gym and sports equipment

- screens
- shade structures and covered ways
- metal storage racks (for equipment, and materials technology timber and metal stock)
- bicycle storage racks
- crash barriers
- loading dock bumpers
- all associated work

Metalwork shall satisfy the following requirements:

- protected against corrosion
- adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or be separated by suitable spacers
- adjacent materials and products, including adhesives and sealants, shall not stain or contaminate, and shall not cause visual or structural defects in adjacent materials
- fixings and framing shall accommodate all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety
- all visible fixings shall be evenly and neatly located and aligned
- visible fixings in accessible areas shall be vandal resistant
- where required to be finished flush with adjacent surfaces, visible fixings shall be countersunk
- trafficable surfaces shall be slip resistant
- metalwork shall be fabricated to a high standard fit and finish
- cut edges, drilled holes, joints and surfaces shall be finished clean, neat, free from burrs and indentations. Sharp edges shall be removed without excessive or uneven radius
- surface finish, colour and texture shall be continuous and without variation
- free of sharp edges or projections which could cause injury to users
- exposed fixings that are subject to human contact shall be recessed, smooth and flush

6.5. Equipment Cages

Externally installed mechanical equipment, valve and meter assemblies, etc. shall be protected using fabricated galvanised steel metal lockable security cages that only permit access to authorised personnel. Padlock keys shall be coordinated with the building keys.

The units shall be designed such as to provide easy access for regular inspection and maintenance, with the provision to be de-mountable to enable major repairs and replacement.

6.6. Bicycle Racks

The Contractor shall provide racks for leaning support for bicycles and scooters in the bicycle sheds. Racks shall be hoop shaped or similar, fabricated from tubular steel, 850mm high, with bolting plate flanges at ends for bolt fixing to the concrete pavement. Racks to be finished with heavy duty hot dipped galvanizing suited to external exposure and abrasion.

Lighting: Bicycle sheds shall be provided with lighting to maintain 20-30lx across the racks. Lighting controls shall be automatically operated from dusk to dawn.

6.7. Timber Finishes and Treatment

The Territory's preference is that exposed timber is not used externally as a cladding or lining, or as the construction material for fascia's, screens, framing and cladding to pergolas, shade structures and covered walkways, posts, fences, gates, platforms, decking, seats and benches, retaining walls, etc.

The Contractor shall provide all required framing, fit out and trimming carpentry, including timber fixings and accessories, and shall as a minimum ensure that timberwork:

- including wall panelling, screens, rails, fitments, furniture and the like are constructed of timber from certifiably sustainable sources
- has natural durability appropriate to the conditions of use and exposure, or preservative-treated timber of equivalent durability
- does not contain live borers, insects or other pests, or rot or fungus infection
- where required, has received preservative treatment and/or water-repellent treatment
- accommodates all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety
- accommodates all short and long-term movements and deflections in the base-structure, substrate to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base-structure to the work of this trade
- has adequate dimensional stability for the ambient conditions, and shall not change size or shape in a manner which will detract from appearance, performance and durability of the work, or damage adjacent or applied work
- if recycled (and approved for use), is selected to avoid visible defects, embedded nails and other metal objects, decay or borer attack
- structural members shall be 'building grade' if concealed, or 'appearance grade' if visible
- fixings for timber framing shall be suitable corrosion resistant types as required to assemble and hold the work in place, and are selected for correct size and spacing
- Medium Density Fireboard skirtings / architraves shall not be used in wet areas

The grades of timber veneers shall be at a minimum:

- select grade, veneer quality A, for visible surfaces to have clear finish or to have no coated finish
- general purpose grade, veneer quality B, for other surfaces

Timber that has been pressure or dip treated with copper-chromium-arsenate (CCA) preservative shall not be used.

6.8. Walls and Linings

Every space or room shall be provided with walls and wall linings, with wall construction and linings suitable for and consistent with the function and use of the space.

The Contractor as a minimum shall ensure that all walls and linings and associated work:

- have provision for controlled expansion and contraction;

- have fire resistance or appropriate acoustic properties to meet the performance criteria and functional requirements of the space
- must not be damaged by structural building movements and are rigid and safe under all loading and height conditions, including when work is later applied by other trades
- must remain stable without deflection, damage or rattling under normal conditions of use and slamming of doors
- where likely to be subject to high traffic, impact damage or loading (including corridors, stairwells, storerooms, materials technology workshops, student toilets, etc.), shall be durable, resilient and resistant to impact damage, and have additional support provided
- have wall framing and furring systems that are complete and which are suitable for the location and the intended function
- have smooth junctions between lining components, finishes, and adjacent surfaces
- have flush wall and ceiling joints
- permit thermal movement for embedded items required to be sheathed, such as water pipes
- have seal joints and that junctions to adjacent work maintain the integrity of fire, smoke, acoustic and moisture barriers
- have continuous thermal insulation provided to minimise heat gain or loss from outside

Wall surfaces and finishes shall be selected for durability and easy maintenance consistent with the function.

By way of example:

- provide impervious wall surface (sheet vinyl or glazed ceramic wall tiles) behind wall mounted hand wash basins, urinals, toilet pans and cleaner's troughs from floor level to minimum 2100mm (nominal) height, and a minimum of 200mm above the top of slab urinal stalls. Actual height of impervious surface to suit building design and detailing. Increase height so that wall mounted fitments (e.g. paper towel dispensers) do not bridge two material backgrounds
- provide waterproof, seamless resilient wall finishes to 2100mm (nominal) height in shower compartments
- provide waterproof and easily maintained resilient finishes over benchtops to a minimum of 500mm where there is risk of splash or liquid spills

The Contractor shall give careful consideration to material selections for wall linings in locations where impact and damage can be expected. Without limitation, walls are at risk of impact from chairs and furniture, mobile trolleys, and wheelchairs and mobility aids. Walls in gym and fitness areas will be subject to impact from sports equipment and from Users.

Wall construction and linings shall assist in the management of the acoustic performance of the space by controlling noise leakage and noise intrusion.

Wall layouts shall maximise the area available for display space, including fitted pinboards and applied display board materials.

Quality Assurance Requirement – wall framing:

Hold point before application of wall sheetings and linings: The Contractor shall take digital photographs of the unlined wall framing for each internal and external wall in each building, to provide a visual record of installed services, installed insulation, and wall framing (showing locations of studs, noggings and support cleats for fitments). Digital photograph records (including named/ numbered photographs and plans cross referenced to

the photo locations (by photo name/number)) shall be issued provided to the PAP, progressively as wall framing proceeds. The Hold Point will be released following acceptance, by the PAP, of the Contractor's Digital photograph records submission.

6.9. Tiling

Where floor or wall tiling is proposed in the works, the Contractor shall perform all required tiling materials and construction, including substrate preparation, priming, bedding and adhesives, joints and grouting, tiled or coved skirting's, trims and control joints and shall ensure these are appropriate for the conditions and performance requirements.

The Contractor shall as a minimum provide tiling and all associated works that:

- are durable products suitable for the location and the intended function
- can accommodate applicable live and dead loads
- can accommodate movements and deflections in the base-structure and substrates, without failure or loss of adhesion, performance or durability
- ensure that tiled pedestrian surfaces are stable, safe and minimise risk of slipping or tripping due to slippery or uneven surfaces
- ensure that floor tiles have a minimum R11 slip resistance rating
- ensure that all adjacent materials and products are chemically and electrolytically compatible with each other, substrates, and adjacent work, or are separated by suitable spacers. Adjacent materials and products, including adhesives and sealants, shall not stain or contaminate, and shall not cause visual or structural defects in adjacent materials
- have joints that are plumb, even and neat
- shall be flush with adjacent work unless stepped level change is indicated or required
- are installed with mould-resistant grout where tiles are in wet areas
- ensure that the waterproof membrane system provides a permanent barrier to moisture and water, and shall be waterproof and resistant to water pressure and vapour pressure, condensation and corrosion, and shall remain intact and properly fixed to the substrate under all conditions
- where splashback tiling is provided in wet areas, this shall rise a minimum of 500mm above the benchtop or fixture

6.10. Floor Finishes

The Contractor shall provide all required flooring, including substrate preparation, adhesives, skirtings, covings and trims, suitable for the intended location within the design and suitable for the intended use or uses of the space. Flooring selections shall be appropriate for the use conditions and may include two or more flooring finishes in the one space.

Floors and floor finishes shall be level and smooth, stable, slip resistant, free of trip hazards and suitable for long term performance under heavy pedestrian traffic, and suitable for the passage of mobile trolleys, wheelchairs and users reliant on mobility aids.

Division strips shall be provided at junctions of dissimilar flooring materials. The finish of adjacent floor finishes shall be to a common surface datum, so that no trip hazard is formed. Metal movement control cover plates shall be provided in floor finishes where structural control joints have been formed in concrete slabs.

The Contractor shall as a minimum ensure that the flooring finishes are:

- highly durable and easy to clean
- appropriately sealed to minimise dust
- slip resistant particularly in wet areas or where water, oil, grease, sawdust, steps / stairs etc. may be present
- acoustically compatible with the background and activity noise levels within the space
- of thermal and tactile comfort in relation to the usage of the space
- installed with minimal undulations

6.10.1 Carpets

Flooring to teaching, office and administration zones shall be anti-static commercial grade carpet or carpet tiles, consistent with room use and traffic.

The Contractor shall provide carpets and mats, carpet tiles and all required components including floor finish dividers and edge strips, steel trowelled underlays and adhesives and all associated works.

The Contractor as a minimum shall ensure that all carpets and mats, carpet tiles and all required components:

- new product (not recycled)
- must be appropriate for their particular use
- have textile dyes and pigments that are colour-fast and fade resistant to day-light, and resistant to water
- avoid the accumulation of undesirable electrostatic charges
- contain an appropriate substrate to be prepared to receive the carpet installation
- contain a smooth transition between all adjacent flooring types
- have edges between carpet and other flooring materials finishing with mouldings suitable for the particular use. Plastic edge strips or non-flush materials are not acceptable
- are laid in a single area and shall be of a single specified type, quality, colour and design, and comes from one manufacturing batch and dye-lot. Inconsistency of carpet is not acceptable

Small cut portions of carpet tiles shall be glue fixed into place using construction adhesive – not tack adhesive used generally for carpet tiles.

6.10.2 Resilient Sheet Flooring

In store rooms, amenity rooms (including toilets, first aid room, change rooms) and the like and in rooms, spaces and locations where wet activities occur (including art, science, canteen, food preparation), the Contractor shall provide commercial grade resilient sheet flooring with an upper surface treatment suited to the function or activity of the space. A chemical resistant grade resilient floor finish shall be used where the function of the space involves risk that staining liquids or corrosive chemicals will be spilled. An anti-static type flooring shall be installed in the data communications rooms and in Learning Community or Specialist areas where anti-static properties are appropriate.

Resilient sheet flooring shall be laid on a smooth, level concrete slab substrate where an effective low-permeance vapour barrier has been placed directly beneath the concrete slab.

The Contractor shall, as a minimum, ensure that all types of resilient sheet flooring and all required components:

- are appropriate for their particular use
- are durable, easy to clean, and resistant to marking and staining
- are set out within a space to minimise the number of joints and seams
- are installed smooth and firmly bonded to the substrate, with no bubbles, undulations or defects
- are appropriate for heavy pedestrian traffic and are stable, safe, and minimise risk of slipping or tripping due to slippery or uneven surfaces
- have specific non-slip vinyl properties in wet areas, areas subject to water spills (e.g., canteen, food preparation and laboratory areas) and barefoot areas (minimum slip resistance rating R11)
- have all seams welded and sealed and all junctions between different vinyl types finished flush
- must contain junctions between vinyl flooring and other flooring that are finished flush. Plastic junction strips or junction devices which are not flush are not acceptable

6.10.3 Resilient Sheet Sports Flooring

Resilient sheet sports flooring (where provided) shall be provided includes the following properties:

- must offer class 2 shock absorption according to the ASTM F2772 standard
- must be durable, easy to clean, and resistant to marking and staining
- must have a resilience capable of accommodating non-sporting functions including shoe traffic and the set-up and use of furniture (tables, chairs) without damage to the sports floor
- must be set out within a space to minimise the number of joints and seams
- are installed smooth and firmly bonded to the substrate, with no bubbles, undulations or defects
- have all seams welded and sealed
- line marked in different colours to delineate the court markings for all of the specified sports

6.10.4 Timber Flooring

The Contractor shall ensure that all areas of timber flooring and all required components:

- are appropriate for their particular use
- are firmly supported on a suitable substrate with strength sufficient for the function
- are durable
- are slip resistant and have minimal undulations

6.10.5 Sprung Timber Sports Flooring

Sprung timber sports flooring (where provided) must include the following properties:

- hardwood flooring boards, seasoned select grade Spotted Gum (*eucalyptus maculata*) or approved equivalent type or material, ex. 21mm thick x ex. 60mm wide
- laid on battens that incorporate resilient synthetic pads at 450mm centres
- shall offer class 2 shock absorption according to the ASTM F2772 standard

- provision for expansion in the flooring material by providing expansion joints in the sports floor in accordance with local humidity conditions and the anticipated behaviour of the flooring, and including a 5mm gap to full perimeter and at all vertical obstructions
- a timber skirting that facilitates ventilation to the sub-floor space
- sanded smooth and finished with a clear multi-coat sealer
- line marked in different colours to delineate the court markings for all of the specified sports

6.10.6. Dance/ Drama flooring

Where Dance and Drama functions are accommodated, flooring shall comprise a sprung timber flooring (as for sports floor), with an applied finish suitable for the activities.

6.10.7. Floor Mats

At external entrances, provide internal walk off mats to prevent tracking of rainwater, dirt, sand and other contaminants onto internal floor surfaces. Install recessed and framed matwells complete with inset resilient mats that can be easily cleaned. The adjacent applied floor finish and the installed mat shall both be level with the top of the matwell perimeter frame. Mats shall be not less than the width of their respective entry doors, and to be of a length that cannot be crossed in a single step.

6.10.8. Skirtings

Skirtings shall be provided over floor finishes to all internal walls. Skirtings must include:

- flat satin anodized aluminium or finished stainless steel sheet skirting with a minimum 1.6mm adhesive fixed to wall lining
- vinyl skirting profile adhesive fixed to wall lining
- resilient vinyl flooring material turned up over a shaped coving profile backing and adhesive fixed to the wall lining to form self-coved flooring. Use this form of skirting in areas that will be cleaned with a wet wash down
- timber skirting sections fixed through the wall lining into the subframe and finished with an applied paint coating

The longest possible skirting sections for each situation shall be used. Skirtings shall be installed to a level horizontal line fitting flush against floors. Edges shall butt together to form tight neat joints showing no visible open seam. Skirtings shall be sealed at internal corners and at junctions with door frames and vertical abutments. Align 150mm minimum height of skirtings with height of kickrails in adjacent joinery.

6.10.9. Tactile Ground Surface Indicators

At the head and foot of each flight of stairs or each section of ramp and change in level as required by the relevant regulations and Australian Standards, install compliant panels of multiple tactile ground surface indicator (TGSi) tiles. Tactile panels shall be a colour that contrasts with the adjacent flooring colour to enhance visibility.

6.10.10. Concrete Floor Sealers

Where concrete slab floors are provided in sports storerooms, utility rooms, plant and equipment rooms, the Contractor shall finish the concrete slab with a permanent applied sealer coating that has an integral colour and non-slip finish.

Where the Contractor proposes to use applied epoxy flooring over concrete slab substrates, it shall be ensured that all epoxy flooring and all required components:

- are applied in accordance with the material manufacturer's recommendations
- are formed to coved integral skirtings
- are formed to fall to grated gullies where required
- must be safe and appropriate for their particular use
- are durable and easily cleaned

6.11. Painting and Applied coatings

External surfaces and components must not need paint or other site applied decorative or preserving coatings, except where they have been specifically approved by the Territory.

All internal surfaces of the School (other than surfaces reasonably left uncoated such as face brickwork, or materials that have a factory applied coating) shall be finished with an appropriate applied protective coating system. This requirement includes installations and works associated with building engineering services (including pipework).

The Contractor shall provide on-site painting, proprietary textured coatings, and Site applied two-pack coatings, including substrate preparation, priming, and preparation between coats and be complete multi-coat systems suitable for the substrates, intended function and conditions. Painting includes the supply and application of painting, staining and sealing systems.

The selection of paint colours to be used shall be derived from the colour and materials palette developed for the School by the Contractor. Colour is to be used creatively to add character and interest to internal and external spaces, to define locations and precincts and to identify particular functions. For the avoidance of doubt, a monochrome internal paint colour is not acceptable.

The Contractor shall comply with the following requirements:

- paints that are low in volatile organic compounds (VOC), as defined by Green Star Education v1 IEQ-8 and any subsequent updates are to be used
- all paints and stains shall be premium quality lines only. Trade lines are not acceptable. Only products which are colour tinted by the manufacturer or supplier can be used. Where this is not possible, tints and stains shall only be added if this is without detriment to the durability or aesthetic performance of the product
- the highest grade of any coating product (or premium grade) shall be used
- internal paints shall be selected for strength of coat and resistance to impact damage on surfaces in high traffic areas (e.g.: door panels and door frames), and for ease of maintenance and cleaning (wash and wear) when applied to wall surfaces
- products used in each installation area and finish type shall be from the same product batch. Inconsistency in paint is not acceptable
- ultra-violet resistant paints and coating products shall be used where they are subject to direct and reflected sunlight, including internal locations, to prevent colour fading

Metal safety rails and barriers, bollards, columns to external covered ways, etc. shall be painted in high visibility colours.

Freedom from toxic ingredients: Paint shall not be a Schedule 1 paint within the meaning of, and in specified human contact areas prohibited by, the Uniform Paint Standard issued by the National Health and Medical Research Council.

6.12. Stainless Steel

The Contractor shall provide stainless steel finishes and fabricated elements that at a minimum:

- where in visible, external and/or humid locations, are resistant to corrosion and staining;
- are Type 316 in food preparation/handling areas; and
- are Type 304 in bathrooms, shower rooms, toilets, and the like.

7. Building Fixtures and Fittings

7.1. Joinery and Fixtures

The Contractor shall, as a minimum, provide all joinery required to support the functionality of the School. Joinery works shall include finishes, hardware, coordination with services, required fixings, skirtings, mirrors, glass panels and glass doors and associated trims, conduits or recesses and gaps for electrical equipment, integral lighting, wiring, data cabling and the like including built in GPO's, data outlets, audio visual outlets and inputs and all necessary support and sub-framing necessary to complete the works.

The scope of joinery works shall include:

- custom fitted joinery, vanity benches, kitchen and kitchenette joinery, cupboards, storage units, display units, a bank of document pigeonholes for staff mail and notices, built-in student lockers, built in staff lockers and the like
- joinery fit out to storage rooms, cleaners' stores, sports stores, which considers in each case the range of items that shall be stored, and provides for the specific storage requirements for those items to facilitate ease of access, tidiness of storage, safety and ease of maintenance
- change room benches
- stainless steel and chemical resistant laminate work benches and cabinets in the science and technical areas and similar functions

The Contractor shall as a minimum ensure that:

- cut-outs to accommodate fixtures (such as sinks and hand basins) and equipment (such as fridges, microwave ovens and the like) shall take into consideration the required equipment size and installation tolerances
- selected finishes and detailing are coordinated with the use requirements and functionality (including assessment of risks of leakage, staining, abrasion, chipping, etc.) so that joinery delivers long term serviceability
- where joinery needs to accommodate roller shutter doors and/or grilles, similar size requirements are to be taken into consideration
- accessories and trims necessary to complete installations are provided
- joinery units are fixed to substructure backgrounds to provide sufficient support and all mechanical fixings shall be concealed from view
- junctions with structures, scribe bench tops, splashbacks, ends of cupboards, kickboards and returns follow the line of structure
- all carcass junctions with walls and floors, and to cable entries, are sealed with silicone caulking for vermin proofing to all food handling areas and voids at the backs of units to all areas for hygiene requirements
- all screws, nails, bolts, anchors, brackets, adhesives, and other fixing devices required for neat and secure fixing throughout are provided and are concealed from sight in the finished work

Benchtops shall be constructed of a substrate of medium density fibreboard (minimum 25mm thickness) and be finished and edged in materials suited to the functional requirements of the installation. The default benchtop shall be finished with 1.0mm coloured laminate with solid colour rigid high impact PVC edging to match the selected laminate colour. However, other surfaces to be used may include:

- vinyl counter topping
- stainless steel
- chemical resistant laminate or solid acrylic polymer countertops (for science laboratories, etc.)
- laminated solid timber, solid moisture resistant medium density fibreboard (MRMDF), or face veneer plywood for technology workbenches

Handles shall be robust, simple satin chrome plated metal and sourced from generally available production lines. Consistent with the principles of inclusion, handles shall be easy for any user to operate. Door and drawer handles and pulls to be selected and/or detailed with no sharp edges or protrusions that may cause injury.

Joinery doors and drawer fronts shall have common substrate and finishes and be a minimum thickness of 18 mm MRMDF. There shall be a white melamine finish to all interiors including drawers and shelves in enclosed cupboards. Finishes shall be applied to all surfaces and edges, including edges facing floors. Edges shall be finished with solid colour rigid high impact PVC edging to match the selected cupboard exterior laminate colour.

Shelves shall generally be adjustable, with shelf thickness and provision of supports as required to ensure the shelf can support applied loads without excessive deflection (more than 3mm in 1.0m).

Joinery doors shall be hung on 110° or 180° fully concealed and adjustable hinges. Doors shall open and close easily and shut tightly to a neat line and flush finish. Number and type of hinges specified to withstand weight of leaf and anticipated heavy use.

Joinery drawers shall be fitted with steel and ball bearing full extension sliding drawer runners.

Impervious splashbacks shall be provided above benchtops where there is the risk of splash from sinks or spillage of liquids.

Benchtops that are subject to water spills (such as kitchen counters and vanity benches) shall be detailed to ensure durability and resistance to water ingress and degradation.

Where possible, storage shall be incorporated under benchtops, except where accessibility provision is required.

7.1.1 Accessibility and Inclusion

The Contractor shall provide bench tops and counters (and related and/or ancillary spaces) that will allow and facilitate access and use by students and staff who may use wheelchairs or the like. All reception / canteen counters shall facilitate use by students and visitors who may use wheelchairs or the like. The wheelchair accessible areas of the reception counters shall not be “tucked to one side” but shall be readily identifiable and easily accessible.

7.1.2 Special Joinery Fittings

Where necessary to deliver or complement the required functionality, provide special joinery fittings including:

- cutlery dividers: five compartment white moulded plastic drawer inserts, trimmed to fit the size of drawer carcass
- stationery dividers: as for cutlery dividers above, except seven compartments, in four different sizes
- tea towel rail: two chrome plated steel arms on slide out frame fixed to side of cupboard
- library book return slot and book slide
- adjustable height computer keyboard ledge

- child proof latches to joinery cupboards and drawers accessible by students in an Early Learning Centre or Kindergarten
- cable entry caps: Moulded plastic circular sleeve with swivelling cover plate. Colour matched to benchtop colour
- cable control cages below work desktops
- wardrobe hanging rails
- joinery lock to cupboard doors and drawers (generally keyed alike to locks on each one unit or in each one room, keyed to differ for joinery in separate rooms)

7.1.3 Staff Pigeonholes

Each staff lounge shall be provided with a custom fabricated rack of named pigeonholes (larger than A4 width and depth) for delivery of mail and messages to staff, based on Peak Enrolment staff numbers and including additional provision for visiting specialists, counsellors, etc.

7.1.4 Display Cabinets

The Contractor shall provide glass fronted and lockable display cabinets and cases for the display of 2D and 3D objects in main circulation areas and/or circulation areas associated with learning spaces such as art rooms/ technology rooms/ science labs/ learning neighbourhoods/ libraries/ music rooms/ sports halls. Cabinets to be fitted with adjustable shelving to provide flexibility for display of multiple items of varying sizes.

Items intended for display will include 2D and 3D student creative work and projects, information and notices, school events, school values and vision, sports trophies, memorabilia and historical artefacts.

7.1.5 Adjustable Shelving Systems

Where identified on the FF&E Schedule the Contractor shall provide adjustable shelving systems which are capable of carrying a minimum uniformly distributed load of 55 kg/m of span, without deflection exceeding 5 mm. The shelving system shall allow for vertical adjustments at 50mm intervals.

The Contractor shall provide all brackets suited to fully support the width of the shelves, and all other accessories for the erection and service use of the shelving.

7.1.6 Mobile Storage Units

Mobile storage units are a preferred form of storage in learning environments. Large dimension mobile storage units (two-person movement) are to be constructed by the Contractor as part of the fixed joinery works using materials, finishes and detailing consistent with adjacent fixed joinery generally described as follows:

- nominal 1200mm height, laminate finish MDF cabinet carcass, with boxed dividers (in two, three or four stacks and with three or four horizontal fixed or adjustable shelves) and loose installed moulded plastic trays, or open recesses, castor wheels with locking mechanism, and display board facing to back (reverse side to open recesses);
- variants of the above description suited for specific storage functions.

7.1.7 Art and Materials Technology Storage

The Contractor shall provide built-in storage for a variety of materials (including clay, timber, metals, plastics, fixings and fasteners, glues, solvents and other synthetic products) stored in various configurations (e.g. in long stock, sheet stock, containers, loose items, and materials delivered in volume (on pallets, in containers, etc.).

The Contractor shall provide storage for a variety of hand tools and small powered tools (consistent with the functions and activities of the respective spaces), including – by way of example – shadow boards where a selection of specialist tools can be tidily stored, and drawers, boxes, bins, shelves where quantities of identical tools and protective gear (gloves, eye protection) etc., can be tidily stored.

Where students are required to wear aprons or smocks – provision shall be made in the facility planning and fit-out for wall mounted coat hooks sufficient to carry a class quantity of hanging garments.

7.1.8. Gymnasium Change Bench Framing

A change bench system shall be provided in gymnasium change rooms, comprising tubular galvanised or powdercoated steel frames and slatted hardwood seat.

7.1.9. Sports Equipment Storage

The Contractor shall fit out the Sports Stores with designed racks, bins and open shelving sufficient to allow storage of all sporting and physical education equipment, including the loose fittings required to support sports activities in the gym hall. Sports equipment shall include class set quantities, and shall include balls for a variety of sports, racquets, bats, mats, hoops, and the like.

7.2. Display Surfaces

For all electronic, mobile and fixed interactive whiteboards and AV displays refer Section 12.

Display surfaces shall be available for all users to comfortably reach.

7.2.1. Display Boards

Innovative solutions for the displaying of student work shall be considered with different materials incorporated. The Contractor shall consider the capacity of resilient display surfaces to absorb and moderate sound levels in learning and teaching spaces. Where display boards are provided to meet the requirements of the Functional Brief, they shall comply with the following requirement:

Display boards shall:

- be of an appropriate thickness for their intended function
- confirm to AS/NZS 1859.4, when a fibre insulating board is used
- be sufficiently supported and fixed to the wall or if demountable, fixings shall be concealed
- be maximised along walls in learning spaces to provide areas for display; particularly in primary schools
- be fixed to appropriate circulation areas
- be incorporated into integrated display areas (including entrance halls and other strategic locations)
- be integrated into building wall design and cladding, so as not to appear as an added element
- To aid in the absorption of sound to reduce reverberation times

7.2.2. Whiteboards

Where whiteboards are provided to meet the requirements of the Functional Brief, they shall comply with the following requirements:

- include a white seamless vitreous enamel surface, resistant to chipping and fracture when the base is slightly flexed

- the panels shall be attached to the building substrates to provide sufficient support
- the surface shall be suitable for use with fast-evaporation, dry ease pens
- pen rails shall be fixed to the full width of the bottom edge of the board
- Be mounted at 500AFL for primary schools

7.2.3. Projection Screens

Where projection screens are proposed within the design of the Facilities by the Contractor, projection screens require a matt white projection screen/surface that comply with the following requirements:

- be of a size appropriate to the depth of the viewing area;
- be designed for front projection;
- be spring roller type hanging projector screen in ceiling mounted situation;
- be flame retardant and mildew resistant;
- present a plain surface when extended; and
- provide a uniform distribution of projected light over a wide viewing angle.

Whiteboards as projection surfaces shall be considered.

7.2.4. Green Screen Backdrops

Where specified in the Functional Brief to support digital technology activities, provide green screen wall facings for use in Chroma key filming and editing. Backdrop fabric shall be high quality cotton yarn fibre in the colour that delivers the best photographic background and permits precision editing when used with chroma key software. Fabric backgrounds shall be installed permanently against walls, free from wrinkles or faults. Fabric to run to floor level. Installation to permit roll-on of colour fabric onto floor, or installation of temporary floor panels of matching colour/fabric.

7.3. Window Furnishings

Window furnishings will be required to moderate daylight levels through windows, and to moderate the privacy of spaces served by windows.

Window furnishings shall have a flammability index of no greater than 6 and a label affixed to a representative sample of each different covering indicating in legible characters. Window coverings shall not emit excessive smoke or dangerous fumes when subject to fire conditions and shall conform to the relevant Australian Standards.

The Contractor shall provide blinds to each window with an external view (excluding highlight windows). Blinds shall be retractable to ceiling level, be operated with a child safe chain drive roller system and include a semi-transparent fabric neutral colour fabric.

Where high level windows are provided in spaces that have a blackout/ projection requirement, the Contractor shall provide blinds with remote automatic motor driven operation, controlled by remote control handset. Control of blinds shall allow individual or small group blind control and allow for the blinds to be lowered or raised to any level (i.e. settings of only fully up or fully down are not acceptable).

7.4. Stage Curtains

At the location where a performance space opens to a spectator/audience space, the opening shall be provided with stage curtains.

Stage curtains shall meet the following minimum requirements:

- Simple hanging drape style in heavyweight fabric equal to woven cotton velour (having have a flammability index of no greater than 6) box pleated on 300mm centres, hanging to 10mm of the floor, hemmed all round and with weighting to the bottom hem
- Hung on an overhead suspended metal track using 2 wheeled curtain carriers at nominal 300mm centre
- Curtain track to be in two sections, so that left and right curtains overlap when closed, and with side-track beyond the opening (on the stage side) that permits the curtains to fully open and stack clear of the stage opening
- Operated by a silent, speed variable electric motor drive, providing symmetrical bi-direction horizontal draw, controlled by a wall mounted open/close controller with full open or partial open options

The provision of stage curtains shall be additional to and coordinated with the installation of acoustic operable walls that secure the opening.

7.5. Sanitaryware

The Contractor shall provide suitable sanitaryware across the School to support and complete the delivery of functional spaces and to meet the needs of Users based on the Peak Enrolment Number applicable to the School. Provision of sanitary facilities is expected to support inclusive access and be distributed with the convenience of all Users in mind.

Amenities for staff, students, and visitors shall be provided in convenient locations and in configurations appropriate to the gender, number of occupants, age of occupants and the disability needs of occupants. The layout of toilet areas shall allow for supervision of open areas from the entrance door. Where possible, toilets shall be accessible from inside as well as outside the school building. Consideration shall be given to the range of student ages (beginning with pre-school children) to ensure that age-appropriate fixtures and mounting heights are provided at appropriate locations.

The Contractor shall provide all sanitary fixtures and fittings connected to service pipe work. The work shall include all required anchorages, fixings, lugged elbows and the like as necessary for a robust, durable, impact resistant installation.

The Contractor as a minimum shall ensure that all sanitary fixtures and fittings and all associated work is supplied and installed to satisfy the following requirements:

- new, free from defects, damage, corrosion and surface blemishes
- chemically and electrolytically compatible with adjacent materials and products, substrates, and adjacent work, or is separated by suitable spacers. Adjacent materials and products, including adhesives and sealants, shall not stain, corrode or contaminate, and shall not cause visual or structural defects in adjacent materials
- of appropriate size and fixing height for its location and anticipated use
- of a similar model and manufacture throughout the School to achieve design coherence
- stainless steel pans and urinals shall be utilised in the shared change rooms in the general-purpose hall (and in a sports pavilion if briefed)

7.5.1 Water Consumption – Sanitaryware and Tapware

Sanitaryware and tapware shall be selected for water efficiency. Low flow and autoflow devices shall be selected as described in the ESD Section 8.

7.5.2 Toilets

Toilets shall be floor mounted vitreous china with wall-backed pan and have a strong vandal-proof fixing between the seat and pan with concealed in-wall cistern with anti-vandal fixing accessories. Toilets provided for adults shall have a double flap toilet seat. Single flap toilet seats shall be provided for student toilets.

Toilet suites for pre-school students shall be “Junior suite” type – suited to infant/ junior applications. For Pre-school student toilets shall have single flap seat and may include an exposed cistern.

Where required, disabled access toilet pans and ambulant access toilet pans shall be provided, complete with concealed in-wall cistern, wall extension pedestal, fitted with stainless steel grab rails and provided with code compliant easily accessible flush buttons.

For all toilets or toilet cubicles provided for female staff and female primary and secondary aged students, the Contractor shall provide include space provision for the placement of sanitary disposal units.

7.5.3 Urinals

The Contractor shall determine in its design whether male toilets will include separate urinals or will rely on toilet pans alone. Where urinals are provided, the installation shall meet these requirements:

- Ventilation, flooring, wall finishes, and all detailing shall be designed to facilitate cleaning and to control odours
- Flushing to male student and staff urinals shall be by a sensor technology that prevents false detection and water wastage. Refer to Section 8 ESD
- Staff urinals: Wall mounted vitreous china urinals shall be provided with concealed in-wall cisterns with anti-vandal fixing accessories, or compliant cistern-less systems with anti-vandal fixing accessories
- Student urinals: Wall mounted vitreous china urinals shall be provided with concealed in-wall cisterns with anti-vandal fixing accessories, or compliant cistern-less systems with anti-vandal fixing accessories. Where wall hung urinals are installed in Primary School boy’s toilets, installation heights and urinal configuration shall be suitable for use by male students of all ages and heights – from Prep to Grade 6 – without reliance on temporary platforms
- Student slab urinals: Type 304 stainless steel shall be provided with 1.6mm thickness, grated platform type (no step) with concealed in-wall cisterns and automatic flushing
- Waterless urinals shall not be installed in any areas

7.5.4 Hand Wash Basins

Staff hand wash basins: Must be vitreous china basins, wall hung or self-rimming inset into joinery benchtops. Basins shall incorporate an overflow.

Student hand wash basins: Must be vitreous china basins, wall hung and mounted at an appropriate height. Basin support brackets shall be fixed into solid substructure and resist damage by vandalism (including climbing). Basins provided for primary and pre-school aged students require cold water only.

No drain plugs are required for hand wash basins.

7.5.5 Hand Wash Troughs

Hand wash troughs (where used) shall be wall mounted 1.2mm thickness satin finish type 304 stainless steel trough with rear upstand skirt to conceal pipework and holed for wash taps. Trough dimensions shall be nominally 300mm width x 150mm depth with taps at nominal 450mm centres. Trough installation shall be fixed into solid substructure and have support frames to resist damage by vandalism (including climbing).

Hand wash taps to have automatic shut-off function, where sensor type taps are used, they shall be powered off local 1Φ supplies, stepped down to extra low voltage. Self-powered battery type sensors shall not be used,

7.5.6. Drinking Fountains

The Contractor shall provide distributed drinking fountains around the School including specific provision of drinking fountains internally and externally designed for access by users with disabilities and age levels.

Drinking fountains shall be convenient to external sports and play activity areas.

Drinking fountains shall be stainless steel – wall mounted or pedestal mounted, cantilevered with single bubbler with an automatic shut-off function. Drinking fountains heights shall be coordinated with the age levels of students, and provision shall be made for wheelchair accessible drinking fountains. Drinking fountains shall be proprietary free-standing units type 304 stainless steel bowl.

The minimum provision of drinking fountains is:

- 12 bubbler faucets for a primary school (at 700mm height); and
- 24 bubbler faucets for a secondary school (at 900mm height).

Every drinking fountain shall include a water bottle filler spout (in accordance with the ACT Healthy Weight Action Plan). A proportion of approximately 50% of the drinking fountains will require branding to be advised and 25 % shall be height accessible for disabled students.

Internal drinking fountains shall have an impervious floor finish around the fixture.

The installation of external drinking fountains near sand pits, shall be avoided and where possible a distance ≥50m shall be kept. A push-type shall be installed near sandpits for student use.

7.5.7. Sinks

Inset stainless steel sinks shall be provided with single or dual bowls and integral single or double drainers.

The Contractor shall provide the number of bowls, location of bowl(s), height of bowls, and overall length of sink to suit the particular application. Sinks shall have integral tap holes to suit specified tapware.

7.5.8. Laboratory Sinks

Where deep bowl laboratory sinks are required for a teaching function, the Contractor shall provide the number of sinks, to suit the teaching and learning requirements, and the number of students. All laboratory sinks shall be acid resistant and designed to facilitate cleaning.

7.5.9. Emergency Eye-Wash

In locations where functions and activities present a risk to user's eyes (including secondary science laboratories and materials technology spaces) the Contractor shall provide emergency eyewash stations comprising a small pedestal stainless steel bowl, twin eye drench faucets actuated by a single push button, and safety warning signage.

7.5.10. Clay Sinks

All sinks in Learning Communities shall be connected to a clay arrestor. The number of clay arrestors per learning community shall be identified by the hydraulic designer to satisfy their hydraulic design proposal. Clay sinks shall be inset stainless steel, with extended standing drain outlet, and clay interceptor traps. Clay interceptor traps shall be located external to the building (not internally under bench) and be readily accessible to facilitate periodic maintenance and cleaning.

7.5.11 Laundry Troughs

Laundry troughs shall be inset stainless steel, 45 litre capacity, with single tap hole and rinse by-pass coordinated with washing machine location.

7.5.12 Cleaner's Sinks

Cleaner's sink shall be stainless steel or vitreous china, complete with wall brackets or legs to floor, hinged chrome plated brass grate, and chrome plated trap and waste.

7.5.13 Showers

The Contractor shall provide showers to student / staff changing rooms. Showers shall be safe, self-draining and designed to allow for privacy for each user. DDA accessible showers shall be fitted with stainless steel grab rails, a shower seat and adjustable shower curtains.

Shower heads to general purpose showers shall be anti-vandal fixed head type outlets.

Shower heads for disabled use shall comprise a vertical wall rail, hand shower on flexible hose, integral soap dish and wall bracket.

7.5.14 Floor Waste Gullies

The Contractor shall provide requisite diameter chrome plated brass floor waste gullies in areas where floor wash down is required or as required by regulations and Australian Standards. Gullies shall include a clamping rim suitable for installation into sheet vinyl flooring. Where installed, a shower recess gully integral with the graded floor surface can serve as a floor waste gully. The installation shall ensure that water is free draining to the waste gully with no pooling of water on the floor surface.

7.5.15 Tap Fittings and Fixtures

The Contractor shall provide robust and tamper proof tap fittings with either timed delivery or otherwise designed to meet ESD water saving requirements as detailed in Section 8.

Tap fittings and fixtures shall be satin chrome plate finish on metal.

Cold water tapware shall be coded "blue" and hot water tapware shall be coded "red". Cold water tapware shall be fixed on the right-hand side of the fixture and hot water tapware shall be fixed on the left-hand side.

Laboratory type tapware shall be high goose-neck type, bench mounted or sink mounted and shall be acid resistant to suit the particular application.

Consistent with the principles of inclusion, taps shall generally be controlled by lever handle. Taps in kitchen situations shall be pillar mixer taps. Drinking fountain tapware shall be lever spring-action drinking cocks with mouthguard and 100mm long flanged horizontal extension to the tap. Hand wash facilities for students shall have push button timed delivery taps, with timed settings adjustable across at least two time periods. Taps and troughs shall be located and installed in a manner which minimises damage or vandalism.

Tapware shall have maximum flow rates that complies with the ESD Section 8.

Where cleaners' taps are provided these shall be positioned at a height to allow a bucket to be easily filled and be fitted with anti-vandal tap spindles. Cleaner's taps shall not be fitted with a threaded spout, so that hoses cannot be installed and used inside buildings.

External taps shall be fitted with anti-vandal tap spindles and be threaded to take a standard hose connection. All external taps shall have in-line isolation devices to enable maintenance or replacement. External taps that deliver recycled water shall have permanent safety warning signage above the tap. Where potable water is

delivered to standpipes adjacent to sand pits, the operation shall be simple and with automatic shut-off. External taps shall have service isolation valves installed upstream, for maintainability.

Hands free tap operation shall be provided at hand wash basins where required by the Territory and Municipal Services Directorate or ACT Health for food preparation and food service areas.

7.6. Sanitary Metalwork

The Contractor shall provide general metalwork across the Project to support and complete the delivery of functional spaces with the requisite sanitary metalwork fitments and utility, including:

- stainless steel grab rails: 18/8 Type 304 stainless steel circular tube, satin finish with knurled gripping surface, formed to shapes as required by code or the circumstances of the installation location, complete with mounting flanges concealed behind cover plate, at ends and at even spaced intermediate points
- towel rails (adjacent to showers)
- toilet paper holders
- paper towel dispensers: Satin finished stainless steel interleaved paper towel dispenser units (Note: paper towel dispensers shall not be provided in student toilet areas)
- soap dispensers: The Contractor shall provide fixed, tamper proof liquid soap dispensers in all toilets which are capable of being refillable by maintenance personnel only:
- coat hooks (stainless steel, two hook profile)
- shower curtain rails and shower curtains
- privacy curtain rails and curtains in disabled access change rooms and shower room
- shower seat: Fold away type slatted shower seat incorporating safety spring clutch mechanism
- "sharps" container - 2 litre capacity wall mounted lockable and labelled

7.7. Electric Hand Dryers

Hand dryers shall be of the heavy-duty type, installed adjacent to all staff and student hand wash basins (but excluding hand basins used by pre-school children). Hand dryers shall accommodate two hands simultaneously, have touch-free infra-red sensor activation, and deliver a 10 second hand dry period.

Noise ratings shall be less than 75 dB(A) at 1 metre – measured with hands in the airstream. Assemblies shall be complete with concealed mounting hardware to suit the wall type. Mounting heights shall suit the height of users. Hand driers shall be powered via a local 230V 10A switched power outlet, mounted 2 200 mm above floor level. Power outlets shall be labelled.

7.8. Toilet Partitions

The Contractor shall provide partitions and compartments around toilets and showers consisting of graffiti resistant divisions, fronts, nibs and doors made from solid core panels, together with the necessary corrosion resistant fixings and hardware. Door hardware to comprise hinges, 1 combination coat hook and bumper, and satin chrome plated turnbolt, indicators, bumper and staple.

7.9. Mirrors

Where required for the proper function of a space, or where identified in *EDIS, Part E - FF&E Requirements* the Contractor shall provide mirrors that have:

- a surface with a flatness equal to that achieved by 6mm polished plate
- if of glass, a uniform thickness equivalent to at least that achieved by 6mm polished plate
- a reflecting surface at least equal to that achieved by double silvering on plate glass
- a durability at least equal to that achieved by an electrolytically deposited copper backing to a double silvered plate glass
- fixed at the appropriate height for their intended users

7.10. Signage

7.10.1 General Signage Requirements

Signage shall be installed throughout the School and across site that provides clear directions, instructions or advice for all Users, and that is fully integrated into the design of the buildings and external environments. The design of the built and natural environments shall support the signage through pedestrian layout, colour and material referencing.

The Contractor shall design, document, manufacture and install a complete suite of internal and external signage for all locations and levels of the School as generally described in this section – covering the following:

- school name identification – in the form of wall mounted lettering or signboard (with school logo) and/or free standing single- or double-sided signboard (with school logo)
- school name identification at reception/ entry foyer – in the form of wall mounted lettering or signboard (with school logo)
- pylon or plinth mounted double sided school sign (incorporating printed school name, school logo and programmable digital active message field)
- functional Identification and Information signage
- directional and destination signage
- vehicle, traffic management signage
- safety warning signage
- statutory signage (compliant with the NCC and other relevant codes and standards)

The Contractor shall engage consultant graphic designers to create a coordinated suite of signage (font, graphics, colours, signplate designs and layouts) for all signage across the Project. Signage design shall prioritise clarity and easy comprehension and signage layouts shall avoid ambiguity. Different forms of signage and graphics shall be considered and integrated with the school design. The Contractor shall also consider the reading distance when calculating lettering height (and signboard size) of each sign type.

The School will require a multi-colour school graphic or logo (image and key words) to be incorporated into key signage elements (such as large directory signs and free standing or slab school name sign panels).

While signage shall be in English, the Contractor shall not assume the audience for these signs has fluency in written English. Abbreviations shall be avoided. Where appropriate, the Contractor shall use graphic symbols and incorporate internationally recognised pictograms. In primary schools and in Learning Support Centres, appropriate picture signing and graphics shall be used where possible to describe the function to assist primary age and pre-literate students.

The Contractor shall consider the needs of persons with poor eyesight when selecting a graphic style, typeface and colour selections for signage.

When required by Law or Australian Standards, repeat the sign message for close proximity signs in international Braille format, with text in tactile raised studs in a location at convenient arm's reach.

Signage shall identify routes to and from frequently used facilities from locations where people gather or begin their journey. Along routes, signage shall confirm continuing routes to reach destinations, and identify points of divergence where common paths break into different streams.

Signplate materials, structures, coatings and finishes shall be permanent, non-degrading, colour fast, easily maintained, graffiti and vandal resistant, and suited to the climatic extremes of the ACT for durable long-term exposure. Adhesive cut vinyl lettering does not demonstrate long term durability, and the use of this product is not supported.

The Contractor shall coordinate signage locations with facility lighting or provide specific lighting or internal illumination to ensure clarity and visibility at all times, with particular reference to traffic management signs.

The Contractor shall design and construct support frames, brackets, concealed and/or vandal resistant fixings, backboards, and the like. Where signs have accessible panels, these shall be easily secured, and remain suitable for long term regular access.

Metals and fixings shall be corrosion resistant and suitable for their location and exposure conditions. Adhesive fixings shall not be used.

7.10.2 Statutory Signage

The Contractor shall provide all signage required to comply with all applicable Laws, Building Codes, Authorities requirements, Australian Standards and the like, including:

- service cupboards, rooms, and access panels concealing services valves and controls (e.g. electrical switch rooms, electrical distribution boards, ICT spaces, mechanical plant rooms, gas and water services shut-off valves, buried services routes, etc.)
- fire services (e.g. fire hydrant and hose reel cupboards, fire booster assembly, fire extinguisher and fire blanket signage, signage identifying smoke and fire doors)
- identifying locations of emergency equipment or controls
- identifying emergency egress
- warning signage where special conditions of access or risk apply (e.g. concealed spaces, safety harness access only, buried electrical cable routes, etc.)
- warning of hazards (including HazChem chemical storage warning signs, non-potable water)
- identifying routes of disabled access and circulation
- identifying zones covered by audible augmentation loops
- warning decals on full height glass where required by Laws and Australian Standards

7.10.3 Wall Mounted External School Sign

The Contractor may include a large wall mounted school sign (signboard or cut lettering) presenting the name of the school in a prominent place on the main school frontage. Typeface and colour shall be coordinated with the School's preferred logo typeface, and with the selected colour schemes and the colours of background materials so that maximum legibility is achieved.

Consideration shall be given to available viewlines, and directions of spectator approach (pedestrians and motor vehicle travellers) when deciding on the optimum location for this sign.

The provision of illumination to this signage is not a requirement, however this shall be confirmed during the early design stages.

7.10.4 Double Sided External School Sign

The Contractor shall install, in a suitable location proximate to the main entry, a double-sided school sign (either pylon mounted or plinth mounted) that incorporates static colour printed messages (school name, school logo) and an active digital display field. Underground conduits shall be installed to supply power and to convey comms cables between the school and the sign.

The digital display field shall provide a programmable digital active message field, capable of presenting illuminated text in a variety of formats (static, flashing, scrolling, etc.) and in black and white or colour. LED type display is recommended, with the display panel composed from 300mm x 300mm LED module panels stacked two high x four across. The display sign content shall be fully programmable, through a fixed Cat 6e, data cable for data communication. The Contractor shall provide the school with instructions on the programming and operation of the sign, and all necessary hardware and software needed to deliver a functioning sign. The display sign shall include a time clock function, so that hours of operation of the active illuminated display can be programmed.

The school sign shall be secured within the schools ICT infrastructure network rather than using a 3G/4G/5G service.

Where feasible, consideration shall be given to photo-voltaic power generation and battery storage to power the external illuminated school sign.

Without limiting the Contractor's design response, the Contractor is referred to the following guidelines:

- EDU External School Signage Design Strategy

7.10.5 Naming of Schools and Functional Areas

The Contractor shall obtain confirmation of function and space names for the School before letting a signage package or preparing permanent documentation or schedules that include names of spaces.

7.10.6 Functional Identification and Information signage

The Contractor shall provide all signage required to identify the functions of rooms and spaces, to guide Users, and to facilitate their use of and mobility through and around the School. Utilise a signage system that can easily allow the School to print and replace text when required (for example: when the name on a room sign needs changing).

7.10.7 Multi-lingual Signage

The Australian Curriculum: Languages is designed to enable every student to learn one or more languages other than English from Kindergarten–Year 10. It is the responsibility of the school to decide which language(s) will be taught explicitly in that school.

The Contractor shall allow to produce multi-lingual directory signage in and around the School (excluding statutory signage and main school identification signage). There is no standard alternative language and given that the School will choose its second language, the selection of the foreign language will not be made until the Principal of the School has been appointed and becomes involved with the Project. The production of signage shall be delayed until the Principal has a chance to select the school's alternative language or decides to forego having multi-lingual signage.

Due to the complexities of producing multi-lingual signage, the Contractor shall submit for review artwork proofs for each multi-lingual sign to eliminate errors from manufactured signs.

7.10.8. Door Numbering

The Contractor shall permanently identify the individual number of each external door for each building on the Site. For Facilities with multiple buildings, adopt a numbering sequence that identifies the building by three letter prefix, then D.1, D.2, etc. The door numbering signplate shall be in the form of a small, permanently fixed, engraved metal signplate, colour matched to the door frame colour, and fixed to the external head of the door frame.

7.10.9. Traffic Management Signage

Traffic Management signage is to include the design, construction, Traffic Management Plan and approvals required for the installation of school signage as is required for traffic management on the street outside of the block boundary, to the standard required by TCCS.

The Contractor shall provide all signage required to facilitate the safe and regulated movement of motor vehicles, including:

- warning and prohibition signposts (stop, no standing, no parking, (duration) standing only, buses only, keep clear, give way to pedestrians, no entry, no exit, speed limit, etc.)

where parking is only provided for specific types of vehicles or specific users (e.g.: disabled parking, ambulance only bay, visitor parking, staff parking, small car only) in limited locations, provide post mounted signage to direct drivers to or away from those locations. Where message reinforcement is required (e.g.: disabled parking bay), permanent signage applied to the pavement shall also be installed.

7.11. Equipment and Appliances

7.11.1. Energy Performance – Equipment and Appliances

Where the Contractor is required to supply equipment and appliances under this contract, and where those appliances are covered by an energy rating, the Contractor shall select appliances with an Energy Rating within 1 star of the highest rated product of that type, commercially available in retail outlets. Appliances included in this requirement include:

- Refrigerators/freezers
- Dishwashers
- Clothes washers
- Clothes dryers

Appliances and equipment not covered by an Energy Rating or Energy Star (e.g.: microwave ovens, canteen equipment, laboratory equipment, etc.) are to be selected based on a whole of life assessment that includes fitness for purpose, cost, and comparison of energy use data with other options.

In addition, appliances connected to mains water supply shall be rated 5-star WELS (or better) for water consumption.

7.11.2. Ceiling Fans

High efficiency (for creating an effective airflow) and aerodynamic ceiling sweep type fans may be installed to any spaces with high ceilings areas, reception lobbies or other areas where de-stratification of hot air would deliver benefits including thermal comfort and/or energy efficiency. Controller switch plates shall be resistant

to vandalism. Push button pre-set controllers are preferable to variable controllers with a turn knob and spindle.

7.11.3 Fume Cupboards

Where identified in *EDIS: Part B - Functional Brief* or in *EDIS: Part E - FF&E Requirements*, the Contractor shall install fan vented laboratory fume cupboards. The construction of the fume cupboards and the installation shall comply with all relevant regulations and Australian Standards including AS/NZS 2243.8. Fume cupboards shall be constructed from chemical resistant materials and be double sided to permit students or a laboratory technician to conduct tasks within the fume cupboard. Each active side shall have vertically sliding safety glass screens, and a control panel with digital displays and emergency power shut off. Fume cupboards shall be supplied with power, potable water and a plumbed laboratory sink. The rising exhaust duct shall be concealed behind a matching removable infill panel. When in operation, generated fan noise shall not cause nuisance to educational activities in the space. Electrical power outlets and gas outlets within fume cupboards shall be controlled via master safety switches, a backpressure monitoring re-set system shall be installed for the gas supply. The electrical master safety switch shall not interrupt power to the extract fan.

7.11.4 Stoves, Ovens and Cooktops

The minimum requirements for cooking appliances are as follows:

Stoves: Upright, stainless steel finish, with 4 Electric hotplates cooktop, griller and electric oven. Fold down door to oven. The oven shall have programmable timer and temperature control on a top fascia and removable and adjustable shelves.

Ovens: Recessed mounted, multi-function electric oven with stainless steel fascia and surround, and side hinged oven door with glazed vision panel. Oven interior shall include adjustable oven racks. Electric elements shall deliver roast and grill cooking. Controls shall include multiple heat settings, selection of cooking configurations and LED timer.

Cooktops: Inset, self-rimming, stainless steel finish, with front or side controls. Cooktops shall have a minimum of 4 Electric hotplates and a cooktop surface designed to contain liquids.

7.11.5 Rangehoods and Exhaust Hoods

The Contractor shall provide fan driven exhaust rangehoods above stoves, cooktops and in locations where cooking processes generate heat and vapours. Exhaust rangehoods shall be selected and sized to suit the service requirement. A domestic rangehood might be suitable over a single cooktop, but a commercial standard exhaust hood is required over two or more cooktops or cooking appliances (food technology areas, canteens, etc.). Exhaust rangehoods shall be fitted with multi-speed fans, lights and removable filters, and be ducted to external air. Exhaust rangehoods, whether commercial or domestic types, shall not be of re-circulating type, they shall discharge to outside.

7.11.6 Boiling water units

The Contractor shall provide constant flow reticulated boiling water suitable for hot beverages, in volumes sufficient to suit the user numbers without delay for re-heating. Note for staff lunchrooms, there are peak periods at morning break and lunchtime, when most staff members will use the kitchen facilities. Locate dispenser so that drips and overflow are easily contained. Boiling water units shall incorporate safety features to prevent scalding.

7.11.7. Chilled Water units

The Contractor shall provide constant flow reticulated chilled drinking water unit with lever handle. Locate dispenser so that drips and overflow are easily contained. Subject to meeting capacity and flow requirements, the boiling water and chilled water provision be via a single post dispenser. Ensure chilled water units are vented to reject heat.

7.11.8. Dishwashers

Domestic Dishwasher:

The Contractor shall provide an underbench programmable dishwasher that complies with the following requirements:

- multiple wash cycles including rinse and delayed start
- drawbridge door with automatic (in-function) lock
- stainless steel interior
- supplied with plate and glass racks, and cutlery basket or flat rack;
- low water consumption rating
- façade panel and door panel that can be integrated with joinery and décor

Commercial dishwasher:

The Contractor shall provide an underbench programmable dishwasher that complies with the following requirements:

- all stainless-steel construction
- quick cycle high performance wash
- quick glass wash function
- water consumption per cycle (2.5 litres target)
- drawbridge door with automatic (in-function) lock
- supplied with plate and glass racks, and cutlery basket or flat rack
- food residue filter screen
- drain pump with backflow protection valve

Laboratory glassware dishwasher (High Schools and Senior Colleges):

The Contractor shall provide an underbench programmable dishwasher that complies with the requirements for a commercial dishwasher (above), but includes racking suited to chemistry laboratory equipment and glassware).

8. ESD, Energy and Water Efficiency

8.1. Overview

Note: The requirements in the NCC and ACT EPSDD shall apply to energy and water conservation measures, in addition to the Ecologically Sustainable Design (ESD) requirements in this section. Where applicable, the more stringent requirements shall apply.

The Contractor shall provide ESD designs that are relevant to the circumstances at the site. The range of ESD initiatives proposed by the Contractor shall respond to a wide range of sustainability issues (including material sourcing, landscaping and ecological impacts), in addition to the minimum requirements described in this section.

For any proposed ESD initiatives, the Contractor shall design them in accordance with recognised standards and benchmarks, as described in Green Star or other recognised documents.

8.2. Integrated Ecologically Sustainable Design

The Contractor shall provide a School that, through appropriately integrated design, achieves the stated energy, water, thermal comfort, acoustic and lighting requirements through the application of Integrated ESD Design principles whilst considering ease of operation and maintenance, to reduce whole of life costs.

8.2.1 Energy Performance - Design

The School shall be energy efficient, in a manner that aligns with the Territories Carbon Neutral Governance (CNG) policies, as described by the performance requirements in this section.

In addition to complying with the requirements in the NCC, the School shall achieve at least 4 points under the Green Star Design & As-Built credit 15 *Greenhouse Gas Emissions Reduction* using compliance pathway 15E *Reference Building Pathway*. This equates to approximately a 30% greenhouse gas emission reduction compared to a code compliant Reference Building. At least 2 points shall be achieved through improved performance of the building fabric (equivalent to a 10% energy consumption reduction compared to the code compliant Reference Building) and the remaining points shall be achieved from reduction in greenhouse gas emissions across all buildings on the Site.

These improvements shall be achieved within the Site boundary. The Contractor is not permitted to claim benefit for any reductions in carbon intensity of the ACT grid.

If the School includes multiple buildings, the Contractor may calculate the required percentage energy reductions for each building (permanent buildings and custom designed modular relocatable buildings) individually, or in aggregate.

Energy modelling:

To demonstrate the above, Energy Modelling shall be performed, by an experienced modeller, in accordance with the Green Star guidelines for energy modelling, using validated software. Building parameters (such as floor areas, walls, ceiling and fenestration, 'R' values), modelled inputs and summary outputs shall be included in the reports and any manual calculations (including energy estimates for non-building services) submitted for review. Refer to Section 1.18 for deliverable requirements.

Predictions from the Energy (and water) models shall be produced as monthly consumption values, rather than a lump sum for the entire year, with the effects of school holidays factored in. The Energy Model shall also include spreadsheet-based estimates for equipment including PCs and Office Equipment, Kitchen & Canteen Equipment (including boiling and chilled water), Data and Telecoms Equipment, Lighting (internal and

external), Emergency Lighting, Lifts, Domestic Hot Water and other Miscellaneous Equipment. The monthly estimates shall be programmed to the BMS and tracked.

8.2.2 Energy Performance – On-site PV Generation

The Contractor shall provide on-site photovoltaic (PV) energy generation to cover at least 15% of total energy consumption estimated through software modelling (refer Section 8.2.1). The Contractor is encouraged to provide photovoltaic energy generation systems above 15% of total energy consumption, in line with greenhouse gas emissions reduction targets, where cost effective on a whole of life basis.

Refer to Section 11.18 for Solar PV system design requirements.

Any proposed PV system greater than 100kW (or over the current definition for the Small-scale Renewable Energy Scheme -SRES, as per the Clean Energy Regulator), shall first be proposed to the Territory, and supported by a whole of life cost model – for the Territory’s consideration. The Territory may, at its discretion, approve the larger system or direct the Contractor to revert to a system smaller than 100kW.

The PV systems shall be:

- installed to be resistant to deliberate and accidental damage, including misuse of any emergency power shut off switches
- protected against theft (refer to Clause 16.3)
- located to be free from overshadowing from building elements and trees
- installed for easy access to panels and electronic components for cleaning, inspection and servicing
- installed in a manner where the inverter is protected from the effects of heat, moisture, dust and vibration
- monitored through a Solar PV management system, which is integrated to the BMS, with automatic alarms set up to report poor performance including low contributions to offset daily electricity maximum demand
- installed in accordance with the PV system manufacturer’s installation instructions

8.2.3 Energy Performance – Air Permeability

The Contractor shall design and construct the building envelopes of all conditioned spaces to ensure that the buildings will deliver the performance requirements for permeability (air leakage) of the NCC 2019. Achieving good airtightness requires attention to detail during the design, specification and installation stages. Air permeability shall be tested and verified on site, by a specialist having the necessary equipment and is familiar with internationally recognised testing procedures before the issue of Contract Completion. When tested to the referenced standards for air tightness the permeability shall be required to be $<5\text{m}^3/\text{h}/\text{m}^2 @ 50\text{kPa}$. It is the contractor’s responsibility to ensure that whatever necessary initial testing or measures during construction is undertaken to ensure that the above airtightness level is reached prior to Completion.

8.3. Thermal comfort

The Contractor shall provide HVAC systems for occupied spaces (including classrooms, collaborative areas, staff offices and library but excluding assembly hall, workshops, laboratories and transient spaces), that can achieve a Percentage of People Dissatisfied rating of $\leq 10\%$, as defined by the current edition of American Society Heating Refrigerating and Air-Conditioning Engineers ASHRAE Standard 55, when the internal dry bulb air temperature is at the internal design temperatures specified in Section 10.1.2 (Design Day Internal Temperatures).

The above performance shall be achieved on a design day for the Site, as defined in Section 10.1.2 (Design Day Internal Temperatures), for at least 95% of each functional and occupied space.

Thermal comfort modelling:

The modelled design for each building shall be the same as the one used to demonstrate compliance with the energy and lighting requirements. The Thermal Comfort model shall be performed by an experienced modeller, using validated software.

For each building, the Contractor shall justify the assumptions used regarding the occupant population type, clothing levels (reflecting summer and winter clothing selections), metabolic rate, relative air speed (including the use of ceiling fans or not) and mean radiant temperature (including the effects of direct sun).

Modelled inputs and parameters including all assumptions shall be submitted for review - refer to Section 1.18. Documentation Deliverables.

8.4. Natural Lighting (daylighting) and Glare Reduction

To improve indoor environment quality (IEQ) and to reduce the need for artificial lighting, the Contractor shall achieve daylight illuminance of at least 160 lux for 60% of functional and occupied spaces (including teaching spaces, staff offices etc.), for 80% of Core Hours over an Academic Year, as set out in Green Star Design & As built v1 Visual Comfort 12.1C. The Contractor shall also design the spaces to minimise as much as practical the extent of area that exceeds 2000 lux at any time during the course of a year.

Solar glare and heat infiltration shall be controlled through a combination of building design and orientation, external screens, shades and/or blinds, fixed horizontal and vertical shading, internal blinds, etc. Fixed shading devices and building elements shall shade the façade plane at 1.5m in from the viewing façade for 80% of occupied hours at autumn and spring equinoxes and summer and winter solstices.

Daylight modelling:

The daylight model shall be consistent with the design used to demonstrate compliance with the energy and thermal comfort requirements. The daylight model shall be performed by an experienced modeller, using validated software.

Placement of external covered ways and placement of trees near buildings would affect window exposure to daylight. The provision of covered walkways and trees shall be considered when modelling daylight for buildings, and modelling shading onto buildings.

Modelled inputs and parameters including all assumptions shall be submitted for review - refer to Section 1.18. Project Deliverables.

8.5. Water Efficiency

The School shall be water efficient whilst providing a quality of water suitable for the different requirements.

The Contractor shall ensure that new Schools comply with the *Waterways: Water Sensitive Urban Design General Code*. Mains water use shall be reduced by at least 40% from 2003 water usage levels (assuming 'A' rated fittings and appliances and 6/3L dual flush toilets). The Contractor shall provide appropriate and justified calculations demonstrating compliance, such as using the current *Green Star Design and As Built Potable Water Calculator* and *Potable Water Guide*. The 40% reduction shall include water used within buildings and for irrigation, but excludes water used for fire test systems.

Water fixtures and fittings shall meet the following Water Efficiency Labelling and Standards (WELS) star ratings:

- toilets – 4-star WELS

- urinals – 5-star WELS
- indoor taps – 6-star WELS
- showers – 3-star WELS (7.5L/s)

Water storage shall be in the form of either below ground tanks, above ground tanks, or a combination of both. Installations for above ground rainwater tanks shall be in accordance with *Rainwater tanks: Guidelines for residential properties in Canberra*, the NCC and relevant Australian Standards. The Contractor shall obtain EPSDD approval for Rainwater tank installations. Water shall not be re-cycled from any greywater sources, hard stand areas, or driveways -which could be polluted.

Water consumption modelling:

Water consumption shall be modelled, in accordance with ACT WSUD requirements. The water use model shall be performed by an experienced modeller, using validated software. Modelled inputs and parameters including all assumptions shall be submitted for review - refer to Section 1.18. Project Deliverables.

The monthly consumption shall factor impacts from school holidays. The predicted monthly consumption shall be programmed into and tracked by the BMS.

8.5.1 Non-potable Water Distribution

Regardless of the extent that non-potable water is provided, the Contractor shall provide separate *non potable* water supply pipework to end uses that do not require potable water (e.g. irrigation and toilet flushing) and those that require potable water.

8.5.2 Stormwater

Comply with the Water Sensitive Urban Design Requirements of EPSDD as a minimum, as required for a DA. Stormwater quality shall meet the following minimum targets, in comparison to a catchment area with no water quality management controls¹:

Reduction in average annual suspended solids (SS) export load	60%
Reduction in average annual total phosphorus (TP) export load	45%
Reduction in average annual total nitrogen (TN) export load	40%

Stormwater quantity shall meet the following minimum performance targets:

Reduction of runoff peak flow to no more than the pre-development levels and release captured flow over a period of 1 to 3 days	3-month ARI
Reduction of peak flows to pre-development levels	5 year to 100-year ARI

The following items shall be considered to help achieve the stormwater quantity and quality targets, along with any effects on available space and Workplace Health and Safety:

- Plantings and landscaping features to slow and treat stormwater and provide habitat, such as retarding basins, detention in dry basins, filter strips, swales and bioswales (also see Biodiversity requirements)
- Minimisation of impervious surfaces

¹ Authorised by the ACT Parliamentary Council, *Waterways: Water Sensitive Urban Design General Code*, Section 3.2

- Inclusion of permeable surfaces in car parks and other hardstand areas (also see Biodiversity requirements)
- Rainwater capture and reuse

8.5.3 Fire Protection Water Re-cycling

Where water-based fire protection systems are installed, the system is not to expel water for testing, or temporary storage is to be provided to allow the reuse of 80% of routine test water and maintenance drain-downs. Sprinkler systems in multi-storey buildings are to be provided with floor-by-floor isolation valves.

8.6 Building Management System (BMS)

8.6.1 BMS Description

A BMS shall be provided by a specialist having an intimate knowledge of the system and an established track record in the ACT, with the capacity to deliver the requirements specified including the 12-month Defects Liability Period, covering system monitoring, optimisation and responding to call outs including emergency response.

A BACnet compliant, direct digital control (DDC) type, BMS shall be provided with the following features:

- a. centralised scheduling and adjustment of set-points, through local or remote access
- b. control and monitoring of the HVAC Systems affecting the indoor environment and thermal comfort
- c. optimised performance and energy efficiency of mechanical and other services as specified
- d. monitoring and recording of energy and water consumption from all metered (and sub metered) services including solar PV and energy consumption registers from variable speed drives
- e. remote access to authorised users to enable monitoring, trending, interrogation, troubleshooting, alarm annunciation and system optimisation

Note: Remote access to the BMS shall be provided through a separate land line connection, and not through broadband cellular networks (3G/4G/5G or similar), unless as a temporary measure should a landline not be available to the School at the time of Completion, and only until such time until a landline is available. **The contractor must liaise with SSICT on their requirements.**

- f. Modular, scalable and flexible for future expansion and re-configuration with the inclusion of at least 15% universal I/O across all controllers in each DDC outstation, with 30% spare space within DDC enclosures.

8.6.2 BMS Points List, Functional Description and Workshop

During the early design staged, before system engineering commences, the Contractor shall produce a comprehensive BMS Points List and Functional Description that incorporates the BMS functionality and key control parameters and submit to the PAP for review. A ½ day workshop shall be facilitated in Canberra, to finalise details with key stakeholders, before the BMS installation commences, and equipment is procured.

8.6.3 Control and Monitoring System

The BMS shall be connected to the following equipment, noting that energy and water metering requirements are specified separately and in more details under specific sections:

- a. All HVAC systems. For equipment that have inbuilt controllers such as chillers, VRF type air condition systems, and other specialist equipment, the BMS shall exert supervisory control and monitoring functions through appropriate high level or low-level interfaces designed for reliability
- b. Refer to Section 10.1.3 for the control of space temperatures in Computer and Data Rooms
- c. Variable Speed Drives- for control and monitoring
- d. Solar PV- monitoring energy production and fault status
- e. Fire protection Systems- through GFR where shutdown is employed
- f. Domestic Hot Water: Centralised systems- control of DHW circulators and monitoring DHW flow and return temperatures. Monitoring water consumption for DHW
- g. Other systems- including Lifts, Intruder Detection, Access Control, Lighting Controls, Surge Protection Devices (to all switchboards)- monitoring fault status

The BMS shall have the capabilities for achieving the necessary functions for the School, including safety, functionality, performance, comfort, energy and water efficiency, reliability and maintainability, including the following:

- a. network of distributed DDC type field controllers reporting to a central (head end) controller, which provides data archiving and remote access. The location of the head end shall be confirmed during the design stages
- b. provides centralised scheduling and adjustment of setpoints, allowing different schedules to be set for different groups of plant and equipment (e.g. classrooms, staff rooms that operate over school holidays)

Note: Where certain spaces are classed as multi-use, e.g. the school hall may be used for sports, assembly and special functions, set-points appropriate for the activities shall be programmed in the BMS, and the time scheduling shall automatically change the set point to suit
- c. control systems shall accommodate power failure and ensure the automatic resetting of the systems through a staged start up process to avoid electrical overloads
- d. has a centralised master clock which keeps track of the calendar, including daylight saving and can be programmed for public holidays, school holidays, scheduled and unscheduled after -hours events across the different zones and equipment, including different set points for multi-use spaces
- e. field controllers having local memory with the capacity to locally store 40 days of trending from all points and metered service data logging (in the event of hard disk failure in the head-end)
- f. central controller (head end) that records all data (including energy and water) and provides trending of all control points at an interval of at least every 10 minutes (typically at 15 minutes). The memory capacity shall be sufficient to retain data for a period of at least 18 months, with 2 x n redundancy in the hard drives. Data (irrespective of quantity) shall be exportable from the BMS through a single download, rather than multiple downloads, locally or through remote access
- g. provides summary reports (graphical and tabulated) on daily, weekly and monthly timescales, with comparisons of energy and water usage from the same time the previous day, week, month and year. generates exception reports (alerts) if energy and water usage exceeds set thresholds (including modelled predictions) and unusual after-hours usage (including holidays) or significant usage above the norm for comparable time periods. generates alerts if the total of electricity, gas and water sub-meters do not sum to the aggregate in each main meter

- h. The BMS shall be able to export (on a daily basis) the recorded data of the school's electricity, gas and water usage and solar PV generation - suitable for upload to a public website (public smart meter portal) - in a format acceptable to the Territory
- i. records all events including manual user intervention (with user identification) and alarms, in an electronic log
- j. has a high definition graphics display monitor, (at least 1200mm wide x 600mm at a location to be confirmed) to provide information and educational input as a live 'textbook', on utility consumption to staff, students and visitors. The extent of information to be displayed shall be confirmed during detailed design and shall include the following:
 - o Time and outside temperature
 - o real time KW consumed, solar PV kW generated and water consumption (L/h)
 - o Energy and water consumed, and generated, as a rolling day basis
 - o Electricity and water consumption profiles including baseload
 - o Rainwater tank status including collected, mains water usage (to fill rainwater tank)
- k. The ability to export recorded energy and water consumption data to a public website (public smart meter portal) - in a format acceptable to the Territory
- l. provides a maintenance page that includes information such as hours-run for equipment, differential pressure status across air filters identifying clean and dirty status considering effects of variable air volume systems

8.6.4 Temperature Sensors and Local Controls

Each thermal zone or functional space (whichever is smaller), where conditioned, shall have its own temperature sensor that is connected to the BMS for control and monitoring. The temperature sensors shall be installed to be free from spurious influences such as solar radiation, heat gains from office or other equipment, supply air from diffusers, air leakage through unsealed cable glands and conduction through external walls etc.

Sensor cable glands shall be sealed, and the sensors shall be mounted on insulated backing pads which are at least 10mm thick and 25mm greater than the dimensions of the sensor mounting base.

Temperature sensors shall also be installed within the Main Switch Room (MSB room) and all comms rooms (including BD1 room and satellite comms rooms) for monitoring of room temperatures by the BMS.

The location of temperature sensors and control algorithms shall be such as to ensure that there is no wasteful simultaneous heating and cooling occurring between equipment, within systems and/or between adjacent zones.

Where conditioned spaces have large operable walls and windows in the building external elevation, reed switches (connected to the BMS) shall be installed, which detect the opening, and initiate a temporary shutdown (or set-back) of HVAC.

Refer to Sections 10.2 and 10.3 for the control of local extract ventilation (LEV) from office equipment such as photocopiers and toilets and workshop equipment.

All sensors shall be robust and tamperproof.

8.6.5 Carbon Dioxide Sensors

CO₂ sensors shall be installed when such sensors are a part of a Demand Controlled Ventilation (DCV) strategies, in accordance with AS 1668.2, for energy efficiency in areas that have a high proportion of outside air with highly variable and/or intermittent occupancy, such as school assembly and sports halls, libraries and lecture theatres. Large learning community rooms shall have CO₂ sensors installed for monitoring indoor air quality (IAQ), irrespective of whether they have DCV strategies.

Note: Sensor cables shall be run to all occupied rooms that have temperature sensors, to enable the installation of CO₂ sensors at a later date, if required. Cables shall be terminated neatly, within the temperature sensor enclosures and the BMS DDC enclosure, with sufficient tails and labelling.

8.6.6. Electricity Metering

As a minimum, the Contractor shall provide sub-metering using smart meters in relation to the following items, in accordance with the technical specifications in Section 11 (Electrical Services), noting that the requirements below may be more stringent than those in the NCC:

- for buildings over 1000m², separate metering shall be provided on a floor-by-floor, building-by-building and space use basis. Separate metering shall also be provided for preschool spaces, general-purpose halls and any other space identified in the Functional Brief as being intended for out-of-hours/ third party use and therefore requiring sub-metering
- Separate metering shall be provided for any energy load that contributes over 5% of the total building load, or over 100kW, and to any energy generation system. Separate meters shall be installed to the following:
 - each electrical supply to the site, including on-site generation such as PV, which shall be separately metered and connected to the monitoring system; the amount of energy exported to the grid by on-site generation systems shall also be recorded on the BMS
 - lighting to each building and each floor, external lighting and specialist lighting (e.g. gymnasium, stage or auditorium lighting)
 - all distribution boards. Where distribution boards are split into lighting and power sections, each section shall be metered separately
 - any mechanical (or other, such as hydraulics, lifts) services switchboards installed, other Central Plant (where installed)
 - distribution boards to special areas/uses (e.g. canteen, laboratories, gymnasiums and spaces that may be used for Out of School Hours use)
 - Transportable Classrooms
 - areas utilised as part of Third-Party Use
- Distributed exhaust fans (and any reheats) shall be connected to the MSSB and not connected to general lighting and power meters
- The energy consumption from all variable speed drives (VSDs) shall be monitored by the BMS
- Sub-meters shall be calibrated and set up in accordance with the requirements of the current Validating Non-Utility Meters for NABERS ratings protocol document issued by the NSW Office of Environmental and Heritage

8.6.7. Gas

As a minimum, the Contractor shall provide sub-metering in relation to the following items to the technical specifications stated in Section 13 (Hydraulic Services):

- main incoming gas supply, noting the preferred option is to connect directly to the utility meter, using approved means of connection, through intrinsic barriers where required
- gas supply to each individual building
- end use such as laboratory, workshop or kitchen

Sub-meters shall meet the requirements of the current Validating Non-Utility Meters for NABERS ratings protocol document issued by the NSW Office of Environmental and Heritage.

8.6.8. Water Consumption

As a minimum, sub-metering (connected and monitored by the BMS) shall be installed, in relation to the following items to the technical specifications stated in Section 13 (Hydraulic Services):

- main incoming potable water supply
- potable water supply to each individual building
- potable water supply to each floor (where multi-storey construction is used)
- potable water supply to centralised domestic hot water plant
- potable water supply to any other significant end use (including kitchen)
- potable water supply to irrigation system
- rainwater tank supply to the School
- Class A recycled water supply to the School (where available for use at the Site)
- areas utilised as part of Third-Party Use

Sub-meters shall meet the requirements of the current Validating Non-Utility Meters for NABERS ratings protocol document issued by the NSW Office of Environmental and Heritage.

8.6.9. Thermal Energy

Where chilled and/or heating hot water are used to provide temperature control within the buildings, thermal energy meters shall be provided to enable monitoring and reporting. If a ring main is used, sub-metering is required at each take off from the ring main.

8.6.10. Indoor Air Quality

Indoor air quality (IAQ) is dependent on the generation of air-borne pollutants and their removal or dilution through ventilation using outside air.

8.6.11. Avoiding Pollutants

The Contractor shall reduce or avoid the use of materials that contribute to the pollutant load in the occupied spaces.

As a minimum, the following products shall be low volatile organic compound (VOC) in accordance with Green Star Design & As-Built guidelines:

- paints
- sealants and adhesives
- carpets and flooring

Engineered wood products shall be low formaldehyde in accordance with Green Star Design & As-Built.

The Contractor shall implement strategies that avoid high humidity and condensation, which could lead to mould growth. Typically, such conditions occur when space relative humidity (RH) exceeds 65% for prolonged periods.

The Contractor shall implement strategies to control and remove unavoidable pollutants at their source, such as print areas, cleaners' cupboards, material technology laboratories, etc.

The Contractor shall implement strategies to manage dirt and other pollutants being tracked-in by Users.

8.6.12 Improved Ventilation

Ventilation shall be provided in accordance with AS 1668.2, however to more stringent requirements. Refer to Section 10 (Mechanical Services) for these ventilation requirements. Air filters in HVAC systems shall be grade F5 or better, no reduction in ventilation (AS 1668.2 requires 12 L/s per primary school pupil) is permitted for the higher grade of filtration or through consideration of any residual outside air in recirculated air., or any other factor.

8.7. Heat Island Effect

Shading of hardstand areas shall be provided to at least 30% of hardstand surfaces, as per the ACT Climate Change Adaptation Strategy (draft). Shade structures adjacent to buildings shall be an extension of the building (e.g. covered walkways, extended eaves and verandas). Ample deciduous shade trees shall be a feature of the irrigated grassed areas on the building side of the playground and native trees shall be an extensive feature of the dryland, grassed areas on the outside of the playground.

The Contractor shall consider the concrete colour used for paved areas. Care shall be taken when large light coloured expanses are situated on the northern side of classrooms to prevent glare and heat build-up in the classrooms or other spaces. The normal 'white' concrete causes glare problems, especially if it is reflected into classrooms or is part of a large playing surface. Other non-reflective colours/products shall be investigated and recommended for approval.

75% of the whole site (in plain view) shall comprise of elements that reduce the impact of the heat island effect by meeting any combination of the following items:

- Vegetation in the form of trees and irrigated understorey planting;
- Roofing and shade structures that have Solar Reflective Index (SRI) of:
 - Roof pitch <15° – a three-year SRI >64, or initial SRI >82 where 3-year SRI not available
 - Roof pitch >15° – a three-year SRI >34, or initial SRI >39 where 3-year SRI not available
- Unshaded hardscaping elements that have a three-year SRI >34, or initial SRI >39;
- Shading hardscaping using; overhanging vegetation, roof structures (with SRI per above) or solar hot water or photovoltaic panels; or
- Areas to the south of vertical building elements that are shaded at summer solstice as shown in a shading analysis.

8.8. Waste

The goal of the ACT Waste Management Strategy 2011-2025 is to ensure that the ACT leads innovation to achieve full resource recovery and a carbon neutral waste sector. ACT public school facility design needs to support practices critical for achieving lasting behavioural change to minimise waste and increase resource recovery. The strategy also aims to encourage the on-site reuse of construction and demolition waste.

8.8.1 Operational Waste

Provide a secure area for the separate of waste streams, including organic waste streams. The separation of waste streams, location and size of the waste storage area(s), and user and waste vehicle access to the waste storage area is to be determined via an Operation Waste Management Plan developed in accordance with best practice and prepared by a waste professional specialist, or by using the Prescriptive Pathway outlined in Green Star Design and As Built v1.1 credit 08 Operational Waste.

Provide separate bins for waste and recycling separation in key areas, such as office, classrooms and playgrounds. All waste and recycling collection and storage shall be appropriately labelled and colour-coded for the streams collected.

8.8.2 Demolition and Construction Waste

Minimise construction and demolition waste to landfill to meet either of the following benchmarks:

- No more than 10kg/m² GFA of demolition and construction waste is sent to landfill
- 90% (by kg/m³) of all waste produced during demolition and construction is diverted from landfill

9. Infrastructure

9.1. Utility Services

Electricity services shall be sized to meet the maximum demand of the School to deliver services for the Predicted Peak Enrolment number (PPE), considering spare capacity for future expansion. Refer to Sections 1.5 and 1.6.

The Contractor shall advise the Supply Authority of the maximum demand including the factors for spare capacity, noting that the Supply Authority is not obliged to provide spare capacity. The mounting pads for transformers shall be sized for a transformer that can supply the spare capacity and the consumer mains shall be installed to include the spare capacity.

Hydraulic and gas services shall be sized to meet the demand requirement of the PPE and Non-Mandated Community Facilities including the spare capacities stated in Sections 1.5 and 1.6.

9.1.1 Water Authority (Icon Water Limited)

The Contractor shall:

- liaise with Icon Water Limited to determine the location, size and adequacy of existing water mains within the streets surrounding the Site
- as a minimum supply to the Site a metered Grade 2 connection for fire and water services
- arrange for the upgrade of any water mains as required, to the requirements of Icon Water Limited
- ensure each tapping consists of a dual valve connection for water supplies for the fire service and the domestic service
- ensure each service is interconnected within the Site to provide an alternative supply
- connect to a recycled water main if one is available from Icon Water Limited
- where existing water mains or tapplings are located on the Site and require relocation or removal, arrange for and make application to Icon Water Limited

9.1.2 Sewer Authority (Icon Water Limited)

The Contractor shall:

- liaise with Icon Water Limited to determine the location, size and adequacy of existing sewer mains and available branches within the streets surrounding the Site;
- arrange for any new sewer connection branch or extension of any sewer main to be constructed to the existing sewer system to Icon Water Limited requirements; and
- where existing sewer mains are located on the Site and require relocation or removal, arrange for and make application to Icon Water Limited to purchase and abandon the sewer, carry out cut and seal of the disused sewer and arrange for new sewer main to be installed as required.

9.1.3 Stormwater Drainage Authority (Roads ACT)

The Contractor shall:

- liaise with the Roads ACT to determine the location, size and adequacy of existing storm water systems (pipes or open channels) and available branches within the streets or properties adjacent to the Site and confirm the legal point of discharge for the Site

- arrange for any new storm water connection branch or extensions of any existing storm water systems to be constructed to all Roads ACT requirements
- where existing storm water systems are located on the Site and require relocation or removal, arrange for and make application to Roads ACT to purchase and abandon the system (pipes) or fill in the system (open channels)
- where the Site stormwater discharge is restricted to pre-development flow rates, provide suitable on-site retention and detention to the satisfaction of Roads ACT

9.1.4 Natural Gas supply (ActewAGL)

Note: Natural gas shall not be used for space heating or domestic hot water. Its use is limited for purposes such as laboratories, workshop equipment and kitchens where gas fired equipment is specified.

The Contractor shall:

- liaise with ActewAGL to determine the location, size and adequacy of existing gas mains and available branches within the streets surrounding the Site
- arrange for any new gas connection branch or extensions of any gas mains to be constructed to all ActewAGL requirements
- arrange for the upgrade of any gas mains as required, to ActewAGL requirements
- isolate at each branch take-off and provide check meters at each main take-off and at each main plant item
- where existing gas mains are located on the Site and require relocation or removal, arrange for and make application to ActewAGL and obtain all necessary permits and approvals

9.1.5 Electrical supply (Evoenergy)

The Contractor shall provide the following:

- low voltage supply from utility mains via underground conduits to Evoenergy requirements;
- underground conduits for High Voltage (HV) cabling
- coordination with Supply Authority regarding the provision and siting of electrical substations
- calculation of maximum demand (for the Site) to Evoenergy as the basis for sizing of local electrical substations (where required)

9.1.6 Telecommunications

The School shall be connected to the “SchoolsNET” network through the ACT Government’s fibre network (managed by Shared Services). This connection will be the primary telecommunications connection for the school for all data and voice services.

A secondary telecommunications connection to the Telstra ADSL network shall be provided by the Contractor to serve connection of ancillary (non-educational) services such as fire alarm/brigade connection, security monitoring, and remote BMS monitoring and control.

If connection to the National Broadband Network (NBN) is available at the Site, this connection shall be provided in lieu of the Telstra connection.

The Contractor shall provide separate lead-in conduits from the site boundary to the Campus Distributor (including access pits and cable haul pits) for each service connection. If connection to the NBN is not yet

available at the Site, the Contractor shall install separate lead in conduits to facilitate the future installation of NBN lead-in cable. For the Shared Services connection, the Contractor shall comply with the relevant sections of the ACT Shared Services “Technical Specification for Underground Fibre Optic Cabling” (current version). For third-party lead-in, the Contractor shall comply with the telecommunications provider site infrastructure standards and requirements.

The Contractor is responsible for undertaking all consultation and coordination with ACT Shared Services and with the secondary telecommunications provider, to ensure that the scope of required works is confirmed and approved, and to ensure that acceptable cable pathways are provided to the satisfaction of each provider. Lead in cable installation will be carried out by the telecommunications providers. The Contractor shall ensure that its works are ready and coordinate the on-site works of the two telecommunications providers.

Refer to the most current version of the SSICT Technical Specification for Underground Fibre Optic Cabling.

10. Mechanical Services

10.1. General

The Contractor shall design and construct the mechanical services (including heating, ventilation, cooling, natural gas, compressed air, extraction systems, etc.) to support the School designs and deliver functionality and user comfort in accordance with the requirements of the Output Specification.

The Contractor shall take account of the possibility that areas within the School may be used outside of Core Hours and design the mechanical services for these areas accordingly. Such area could include the gymnasium, hall, learning and teaching areas, specialist rooms, library/learning resource area, school administration and ancillary areas and associated corridors. These areas may also include the hydrotherapy pool (where provided).

The design of the mechanical services shall take into account weather extremes (summer and winter) that prevail in the ACT, the microclimate of the Site, the building form and orientation of spaces, the thermal performance characteristics of the building, occupancy-types, numbers and patterns, restrictions on pollutant emissions and equipment heat gains. Mechanical services shall be coordinated with ESD requirements and contribute to the efficient use of resources, to minimise emissions of greenhouse gases and whole of life costs. Refer to Section 8 (ESD and Energy Efficiency). System performance, occupant comfort, reliability, resilience, energy efficiency and maintainability shall be considered as well as factors including equipment performance envelopes, connection ratios and turndown ratios where applicable, when plant and systems are selected.

The following issues shall be considered when designing mechanical and associated systems:

- plant spatial requirements for installation, performance (unrestricted air flows), inspection, servicing and replacement;
- controls (BMS, facilities staff and user interfaces), including energy and water monitoring, remote access for monitoring, trending, trouble shooting, alarms and re-programming;
- performance, occupant comfort, energy efficiency, reliability, resilience and maintainability;
- noise from mechanical services and its impact on Education Services and administration areas, neighbours and the local community;
- aesthetic appearance (internally and exterior to the building);
- compatibility and response times of systems, considering after-hours and non-mandated user activities;
- the use of natural ventilation where appropriate. E.g. store rooms, garbage areas; and
- building properties including prevention of unwanted solar heat gains (minimal direct sun on glass in summer and shoulder seasons using external shading), sufficient thermal mass, additional thermal insulation and minimising air leakage.

10.1.1 Applicable Regulations and Standards

The work shall comply with all relevant Regulations, Primary Standards and Design Guides, including but not limited to the following:

Note: Should any conflict be noted between the referenced documents, drawings, site specific requirements or other project instructions, this shall be immediately brought to the attention of the Superintendent.

1. NCC- current version: Including the Building and Plumbing Codes of Australia.
2. Local Authority Regulations including ACT EPD and any Fire Authority Requirements

3. Utility (Electricity, Gas, Water - mains, stormwater, sewers) and Network operator's requirements.
4. MEPS: Minimum Energy Performance Standards.
5. WHS Act 2011.
6. Access Platforms, Walkways, Stairways & Ladders: AS 1657
7. Air Conditioning Load Estimation: AIRAH DA 09
8. Air Filters: AS 1324, AIRAH DA15.
9. Centrifugal Pumps: AIRAH DA 01.
10. Commissioning Codes: CIBSE commissioning codes M, A, B, C, R, W, AIRAH DA27 Building commissioning
11. Controls and BMS Systems: ASHRAE-135 BACnet. AIRAH DA 28, CIBSE Guide H.
12. Copper Pipes, Tubes and Fittings- Materials & Installation: AS 1432, AS/NZS 4020, AS 4809
13. Copper Pipes and Fittings (Refrigeration): AS/NZS 5149, AS 1571
14. Degree of Electrical Protection (IP Code): To AS 60529
15. Ductwork: AS 4254.1 and .2, AIRAH DA 03.
16. Electrical Design and Installation: To AS/NZS 3000, including HB 300 and HB 301.
17. Electrical Cables and Sizing: AS/NZS 5000 and AS/NZS 3008
18. Electromagnetic Compatibility of Electrical and Electronic Apparatus: To AS/NZS 4251.1 and AS/NZS 61000.6.1.
19. Environmental Design: CIBSE Guide A.
20. Fans: AIRAH DA13.
21. Fire Dampers: AS 1682.2
22. Fire Protection Systems and Equipment, Routine Servicing: AS 1851
23. Fire Protection of Services Penetrations: AS 4072.1, AS 1530.4
24. Fume Cupboards: AS/NZS 2243.8
25. Gas Installations: AS/NZS 5601
26. Labelling and Identification: AS 1345
27. Mechanical Ventilation and Air Conditioning: AS/NZS 1668.1 and AS 1668.2, as required by the Building Code of Australia.
28. Microbial Control in Air Handling and Water Systems: AS/NZS 3666.1, AS/NZS 3666.2 & 3
29. Noise Levels (internal) and Controls: AS 2107, AIRAH DA02.
30. Noise Levels (external): ACT Environmental Protection Regulations.
31. Paintwork: AS/NZS 2311
32. Plumbing, Drainage and Water Supply: AS/NZS 3500 and the PCA.
33. Pressure Piping: AS 4041, including AS/NZS 1200 and AS/NZS 1210
34. Pressure Equipment, Hazard Levels: AS 4343
35. Pressure Relief Valves: AS 1271.

36. Refrigerating Systems and Heat Pumps: AS/NZS 5149. 1,2,3,4. ASHRAE Standard for Refrigeration System Design.
37. Safety- Guards: AS 4024
38. Safety- WHS: AS 1470, AS 4801
39. Seismic Restraints: AS 1170.4
40. Service of Fire Protection Systems & Equipment: AS 1851
41. Servicing of equipment (during DLP): AIRAH DA19 schedules or manufacturers schedules, whichever is higher
42. Surge Protection: AS/NZS 1768
43. Thermal Insulation: AS/NZS 4859.1, AS 4426.
44. Vibration: AS 2625, AIRAH DA02.
45. Water Heaters (Boilers): AGA Requirements, AS/NZS 5263.1.2. AS 3814, AS 3645.
46. Water Piping, Water Systems Balancing and Water Treatment: AIRAH DA16, DA 24, DA18.
47. Water Supply and Drainage: AS/NZS 3500.1 & 2.

10.1.2 Design Day External Temperatures

When sizing HVAC equipment and systems, recognised software systems (such as Camel, IES, TAS) shall be used, that include historical weather data for ACT, the thermal characteristics of the building, fenestration and shading, ventilation and infiltration. Equipment performance and efficiency at representative loads shall be inputted, where necessary using spreadsheets. When requested for Design Reviews, building and system parameters, thermal characteristics, summary inputs and outputs shall be submitted.

The following Design Day External Temperatures shall be used:

Table 5 – Design Day External Temperature

	Parameter 1	Parameter 2
Summer		
All Facilities and indoor Functional Areas (with the exception of the Campus Distributor)	36 °C DB / 20 °C WB	the outdoor design condition is from AIRAH DA09, allowing a margin for weather extremes.
Campus Distributor (BD1 room)	40 °C DB / 20 °C WB	
Winter		
All Facilities and indoor Functional Areas	-3 °C DB (saturated)	the outdoor design condition is from AIRAH DA09, allowing a margin for weather extremes.

Refer to Notes in section below.

10.1.3 Design Day Internal Temperatures

The following Design Day Internal Temperatures shall be used:

Table 6 Design Day Internal Temperature

Design Day Internal Temperature	Min. °C	Max. °C
Campus Distributor (BD1 room) / Communications Rooms-refer to notes below and section 10.1.15	21	24
Physical Education	16	26
Change Rooms / Showers	18	26
Classrooms, Other Sedentary Teaching Areas, Libraries, Office Areas	21	24
Corridors, Non- Occupied Lobbies, Materials Workshops	18	26

Notes:

- Design ambient temperatures stated above (Table 5) are less onerous than the maximum and minimum ambient temperature limits quoted below, for continuous operation of HVAC systems.
- All HVAC equipment, (including their power supplies), shall be sized to operate without shut-down (via safety trips) within the temperature limits of -7°C and + 45°C. The equipment shall come complete with the necessary features including defrosting, head pressure controls and capacity modulation.
- The temperature variance between minimum and maximum stated in Table 6 is for winter and summer operation, considering energy efficiency (through a control dead band between heating and cooling stages) with an allowance for adaptive human comfort. These temperatures shall not be considered as acceptable variances between adjacent spaces (zones), where the temperature difference between the rooms shall be less than ±1.5°C, when measured at the room temperature sensors.
- Where certain spaces are classed as multi-use, e.g. the school hall may be used for sports, assembly and special functions, set-points appropriate for the activities shall be programmed in the BMS, and the time scheduling shall automatically change the set point to suit.
- Design Day Internal Temperature is measured as the dry bulb temperature in each thermal zone or functional and occupied space (whichever is smaller). Also refer to Section 8.3 on Thermal Comfort.
- When external temperatures exceed the Design Day External Temperature, the Design Day Internal Temperature for the relevant area as set out in Table 5 may exceed the required Design Day Internal Temperature in Table 6 as follows: *Maximum Permitted Internal Temperature = (Design Day Internal Temperature) + (Actual External Temperature – Design Day External Temperature).*

10.1.4 HVAC System General Requirements

HVAC systems shall have the following features:

- Designs shall incorporate the most appropriate system for a particular application, considering factors including the thermal properties of the space, occupancy types and operating hours.
- Systems shall be designed to achieve the design internal temperatures, evenly across the spaces with no discomfort from excessive draughts or noise.
 - systems shall be simple to operate by non-specialist staff, flexible to achieve multi-functional use including after-hours use;
 - routing and location of pipes, ducts, cables and other components shall be aesthetically satisfactory;

- ceiling mounted radiant panels are not acceptable in classrooms or offices unless demonstrated not to create uncomfortable conditions for seated occupants
- natural gas shall not be used for space heating (or the provision of domestic hot water)
- systems shall be capable of maintaining operation at external ambient temperature of 45°C (cooling mode) and at ambient temperature of -7°C (heating mode)
- variable volume systems for air, water and refrigerant are preferred for energy efficiency and comfort. Inverter driven equipment, ECDC fan motors and VFDs shall be used where possible
- indoor cooling units shall not have pumped condensate drains, gravity-based systems are preferred. In (exceptional) circumstance where this is not possible and condensate pumps are used, the systems shall be configured to shut down the AC units in the event of high condensate levels and to raise an alarm via the BMS
- outdoor units shall be located to account for noise, visibility, clear air path, minimisation of air recycling, occupational health and safety and vandalism (e.g. out of reach or protective mesh cage)
- systems shall have sufficient capacity to meet the design load and specified with connection ratio of not more than 110% for VRF units
- provided with supervisory control and monitored by the BMS, through High Level Interface (HLI) cards for all AC units (including split type and VRF type)
- large-scale individual split-type systems, shall not be installed for reasons of aesthetics, controllability efficiency and maintainability
- surface temperatures of heat emitters and associated pipework, located below 2m AFFL, shall be safe (<45°) and not cause injury through contact. Any radiant heating system used, shall not cause discomfort through localised hot spots or asymmetric radiation
- excessive vertical temperature gradients shall be avoided during the heating season and the temperature 2 m above floor level shall not exceed a 3°C differential from floor level
- Condensate drains from AC units shall be thermally insulated along their entire lengths to prevent drips on ceiling tiles and plant room floors, irrespective of whether the pipes are metal or plastic
- The use of belt-driven fans in AC systems shall be avoided. Where possible, direct drive or plug type fans shall be used
- HVAC systems shall be sized conservatively, including appropriate safety margins and connection ratios to ensure that the designed maximum capacities (ratings) are required for less than 5% of the Occupied Hours, averaged over a school year
- The use of cooling towers and evaporative condensers shall be avoided to mitigate water-borne diseases including Legionella. The use of dry coolers or adiabatic-type closed circuit coolers which can be operated without water treatment to control bacterial risks, is permitted

10.1.5 Energy Conservation and Energy Targets

The Contractor shall install HVAC systems that can deliver indoor user comfort on a zoned basis, and that can comply with the energy targets defined in Section 8 (ESD and Energy Efficiency).

10.1.6 Passive Solar Heating and Cooling of Spaces

The Contractor shall heat and cool spaces not provided with HVAC e.g. toilets and enclosed corridors using passive means (e.g. solar energy) and by drawing conditioned air through the spaces from adjacent occupied spaces.

10.1.7. Ceiling Fans

Ceiling fans may be installed in certain areas such as lobbies and break-out areas that have high ceilings, for purposes including the reduction of thermal stratification and to assist air distribution. The minimum height of the ceiling fans (as measured from the underside of the fan blades) shall be 2.4 metres from the finished floor level. Fans in high ceiling spaces shall have extended mounting pole, to facilitate air movement around the space.

Ceiling fans shall be mounted clear of lights to avoid stroboscope effect.

One robust control station per fan with a minimum three speed settings in forward and reverse direction shall be provided. They shall feature time out controls so that they only operate during school hours and only when required. Push button pre-set control plates are preferred, as spindle / turn knob controllers have not provided durable long-term performance in schools.

10.1.8. Fuel Source for Heating

The following requirements shall be complied with:

- Natural gas is not to be used as a source of fuel for space heating and/or the provision of domestic hot water, electricity shall be used, in line with the ACT Governments policies (Appendix to NCC) for carbon neutrality
- Building Services shall be designed in such a manner that reduces the maximum electricity demand from the site
- Natural gas shall only be used when required for applications such as commercial kitchens, laboratories and technology rooms
- The installation of LPG shall be considered in discussion with the Territory, for any specialist systems that have small gas consumptions

10.1.9. Plant and Equipment

The Contractor shall comply with the following:

- The energy consumption from Building Services and FF&E shall be taken into account to the energy performance requirements set in Section 8 (ESD and Energy Efficiency);
- air from occupied areas shall not be used for the provision of combustion air to any gas fired appliance;
- gas fired plant shall not produce high nitrous oxide (NO_x) or carbon monoxide (CO) pollution, with regards to local environment protection regulations;
- ensure that HVAC systems only operate when required. Spaces which will be used for Third Party use, and after-hours, shall be separately zoned and metered (e.g. gym buildings and other spaces). Mechanical services shall be zoned to facilitate such separation and sub-metering connected to the BMS, provided.
- ensure that Plant is not over sized, or inefficient when operating at reduced capacity.

10.1.10. Centralised plant versus individual units

The following factors shall be considered, when assessing whether to provide centralised plant or distributed individual units:

- Life cycle costs considering capital, energy efficiency and maintenance costs
- Maintainability, safety, aesthetics, vandalism and controllability
- warm up time
- space occupancy patterns, including the capacity to effectively support zoning of buildings and use of smaller zones out of hours
- efficiency of systems, particularly in part load circumstances

For redundancy, single points of failure shall be minimised. Duty/standby equipment shall be installed where practical, and central refrigeration equipment such as chillers and heat pumps shall have independent refrigeration circuits.

10.1.11 HVAC System Controls

The systems shall have the following features

- controls shall be BMS based. Refer to Section 8.6.1- Building Management System
- All HVAC system controls shall be designed for safety, functionality, comfort, energy efficiency and reliability, in accordance with industry best practice as described in the referenced AIRAH and CIBSE Guides

10.1.12 Passive cooling

The minimisation of overheating is integral to the successful utilisation of the School.

The Contractor shall consider the following as part of achieving the thermal comfort requirements set in Section 8 (ESD and Energy Efficiency) and the internal temperatures requirements as detailed in Section 10.1.2 (Design day internal temperatures):

- building orientation, daylighting, external shading (by trees and structures), thermal mass, improved thermal insulation
- ceiling fans, to reduce stratification and automatic night purge, where justified

Air conditioning systems shall be used to make up for the shortfall in cooling capacity after the above factors have been implemented.

10.1.13 Data Communications Room (Building Distributor room) - Space Air Conditioning

The Contractor shall provide air conditioning to the School's Communications room, satisfying the following requirements:

- The designated main 'Comms Room' containing BD1, shall have its own HVAC unit operating 24/7. This unit shall be sized for high sensible cooling, typically with an oversized indoor 'evaporator' unit. The BD1 Comms Room shall have a BMS temperature sensor for monitoring and alarm purposes
- Other comms rooms designated as 'Satellite Comms Rooms', housing BD2, BD3, BD4 etc', do not require dedicated HVAC units. They shall have room extract fans, sized for at least 5-ACH (air changes per hour), installed at high level, controlled via the BMS, through a room temperature sensor, set at 26 °C (cut in) with a switching differential of 2 °C (i.e. cut out at 24 °C). Make up air to the Satellite Comms Rooms shall be via a ducted transfer grille installed high level. Should the temperature within these rooms exceed 27 °C for more than 1 hour, (typically over a summer holiday period) the AC unit

in the room that supplies the conditioned air shall be brought into operation, until the Satellite Comms Room temperature falls to 24°C.

10.2. Ventilation

The following requirements shall be complied with:

Most areas of the School including teaching areas, libraries and office areas shall be mechanically ventilated in accordance with the requirements in AS1668.2. Air filters shall be to F5 grade (or higher) with no reduction permitted from the recommended ventilation rates to take account of better air filtration and any other factors.

Areas such as internal toilets, shower rooms, specialist rooms, science rooms fume cupboards, and other areas shall be provided with mechanical extraction, with discharge to the outside. Discharge into roof spaces is not permitted under any circumstances and no re-circulation type extraction hoods are permitted for any application.

The location of outside air intakes shall comply with AS1668.2 and avoid proximity to:

- Objectionable vents and exhausts
- loading areas
- vehicle exhausts, heating exhausts and fume discharges
- Fresh air intakes shall be arranged to minimise the risk of air recirculation under prevailing wind conditions
- Overnight security lighting shall not be placed within 3 m of air intakes, to prevent ingress of nocturnal insects
- make up air to all areas shall be via natural means, assisted, if necessary, by the extraction system. Permanent vents shall be provided independent of the window systems in all areas
- all centralised and/or 3 Phase extract fans shall be controlled through variable speed controllers. Individual toilet or other exhaust fans do not require variable speed controllers
- extract ventilation shall be via wall or ceiling grilles. Floor grilles or door transfer grilles shall not be used, where make up air is required to rooms, this shall be achieved by undercut doors or high-level wall transfer grilles
- systems shall be localised with minimum ducting and local exhaust louvres. The extract ducting from one teaching space or habitable room shall not route through adjacent teaching spaces and habitable rooms. Any ducting shall be formed and installed in a neat manner and where exposed shall be aesthetically acceptable
- in food technology and staff rooms, proprietary domestic style canopies with integral fan and grease filters, ducted to outside, may be installed above each cooktop except in the instance where the capacity of the apparatus exceeds the requirements of AS1668.2 Section 3, when commercial type extraction hoods are required. The provision of make-up air shall be considered
- where possible, canopies shall exhaust to outside individually local to the cooker unit. Where this is not possible (or aesthetically acceptable) the exhaust shall be ducted to outside through sheet metal ductwork, using a speed-controlled fan, the provision of make-up air shall be considered
- fume cupboards shall be provided in accordance with the FF&E Schedule and the Functional Brief. Fume cupboard extraction systems shall be provided in accordance with the relevant standards and

be integrated with the building design. Fume cupboard extract fans shall not be located in teaching spaces

- Ventilation in toilets shall comply with the requirements in AS 1668.2. sized for the recommended extraction rates for fixtures. Automatic fan controls shall be used based on presence detection with an adjustable run-on timer (0-60minute) initially pre-set for 30 minutes. In internal toilets, with no natural lighting, the fan controller may be triggered by the light switch, with the provision of the adjustable run on timer, as mentioned previously. The provision of make-up air to toilets shall be through door undercuts (except external doors to prevent ingress of vermin) or air transfer ducts, no door grilles are permitted for air transfer
- ceiling mounted exhaust ventilation shall be provided above locations where medium and high capacity photocopiers will be placed. The extract fans shall be controlled through the BMS, via local pushbutton controllers with adjustable (0-120 minute) self-timers, pre-set for 30 minutes. The fan controllers shall be labelled "Local Extract Ventilation" "Press on, Auto off". A green LED lamp shall indicate fan operation
- in gyms where full natural ventilation is not achievable, ventilation shall be by means of simple roof mounted extraction fans
- make up air to changing rooms and toilets in physical education halls shall be drawn from the main hall area via high level wall transfer grilles and ducting where necessary

Classrooms and other occupied areas shall have ventilation strategies that are not dependent on operable windows for compliance with the NCC. Operable windows shall only be for the provision of temporary relief ventilation, under exceptional circumstances such as failure of the HVAC system. Each classroom shall have at least two operable windows to provide cross ventilation, with the capability to be key-locked and safety features to prevent falling from heights.

10.3. Dust and Fume Extraction Systems

Materials technology, art and science activities in secondary schools can be expected to generate dust and fumes that require general or task specific extraction in order to maintain safe and healthy conditions in teaching areas.

Dust and fume extraction systems shall be suited to the task, work setting, and nature of the pollutants generated. Managing the fumes from soldering of circuit boards can be managed by simple desktop ducted systems, while fumes from spray booths or welding bays may require hoods, filters and high-volume extraction. For certain applications, downflow extraction benches may be more effective and efficient.

The Contractor shall provide the following with regard to dust and fume extraction systems:

- units shall be self-contained mechanical clean type, located with regard to acoustic performance, equipment security and serviceability. Each unit shall feature:
 - o statically and dynamically balanced centrifugal mild steel fan, direct driven by a 400V, 1- Φ phase Totally Enclosed Fan Cooled (TEFC) motor rated to a minimum of IP54 (maximum fan speed 1440 rpm)
 - o woven fabric media with abrasive resistant properties, selected for optimal performance with regard to operating cost, collection efficiency and service life
 - o acoustic attenuation of the fan assembly and discharge ductwork where necessary (noise levels within occupied areas and externally shall be within Section 15 (Acoustic Engineering)
 - o electrical driven shaker assembly to clean filter media

- o bin type dust collector with robust sealing assembly
- o explosion relief vent with minimal ductwork and changes in direction to a safe discharge area
- Where located externally, the dust extraction plant shall be contained within a security cage

Spray booths (where provided in Materials Technology workshops in P-10 schools and Secondary Colleges) shall comply with the following requirements:

- The design of the booth and the space containing the booth shall comply with all relevant Australian Standards (including AS4114), with the SafeWork Australia Model Code of Practice, and with any other regulatory or environmental requirements
- Booth location to be remote from hazardous spark-generating operations such as welding or grinding
- Booth location to be clear of cross air currents, and with the operator space kept clear and free from obstructions or competing circulation traffic
- Booth shall be of proprietary manufacture, comprising a booth of non-combustible material with an exhaust ventilation system to filter and remove all spray-laden or contaminated air from the booth and discharge it in open air outside
- Booth shall be fitted with reticulated compressed air
- The booth floor and surrounding floor within one metre of the booth entrance shall be of impervious and non-combustible material

Controls for all dust and fume extraction systems shall be located locally and prominently and clearly labelled with the equipment controlled and instructions, including where variable speed fans are used. The controllers shall be of the type: Press on and Press off with Auto off after a pre-set period, initially set for 30 minutes but adjustable (0-120 minutes). A green LED indicator light will display operation.

10.4. Natural Gas

Note: Natural gas shall not be used for the purposes of space heating or domestic hot water. The following section only applies when gas is supplied for kitchens, laboratory purposes or workshops.

The Contractor shall provide metered natural gas infrastructure to the School that complies with the following requirements:

- an independent gas distribution system to areas with outlet points in accordance with the requirements of any cooking appliances, catering equipment and teaching labs, workshops etc.
- the gas distribution pipe work shall be arranged, so that there is one single entry point for the building. A ready means of isolation must be provided to each building in a prominent and easily accessible location, prevented from tampering or misuse
- From this point, distribution pipes shall be routed (in compliance with the Gas Code within the building to the various areas
- each teaching space and kitchen supplied with gas shall be fitted with its own pressure proving system complete with integral emergency gas knock out adjacent to the teaching position/ demonstrator's bench with a second emergency gas knockout located elsewhere in the room. The emergency shut-off system shall include a manual reset key switch system, and shall have a "timeout facility" which will automatically shut off the gas solenoid valve at the end of a programmed time period (which can be adjusted at the controller for a range of pre-set time periods)
- the pressure proving control unit shall be key operated only and isolation of the system shall be student tamperproof. The test mode operation shall operate via the key system and shall not require the

operator to maintain pressure on a test button. The maximum test time of each system shall be 35 seconds

- laminated or framed instruction sheets shall be installed adjacent to each pressure proving system, with completed contact details and hold time for re-set
- each pressure proving system shall be connected to the building's FIP, and shuts off gas supply to the areas during fire alarm
- isolation valves shall be provided to permit isolation and servicing of rooms and spaces containing gas fired appliances or equipment
- gas booster devices shall not be used
- all underground piping shall be adequately protected from damage from vehicular traffic

10.5. Ductwork and Air Distribution

The Contractor shall provide ductwork system design and installation based on design parameters relating to pressure drop, velocity and noise ranges recommended in the AIRAH DA03 Ductwork for Air Conditioning and as required to help achieve the overall energy performance requirements set in Section 8 (ESD and Energy Efficiency). Also refer to the noise requirements in Section 15 Acoustic Engineering.

Ductwork installation and pressure testing shall conform to the NCC and AS 4254, including air-leakage testing for ductwork with airflows over 3,000L/s.

Flexible ductwork lengths in each duct run shall be restricted to the requirements in the NCC, the installation of intermediate rigid (or Spiroduct) sections as a means to avoid compliance with this requirement is not permitted. Flexible ductwork shall be installed strictly in accordance with AS 4254 to avoid kinking and airflow restrictions and leakage.

Systems shall include isolation and balancing dampers at each branch take-off and at each floor-where a multi-storey design is proposed.

Each balancing damper must have access for balancing and commissioning. All motorised dampers must have access for inspection and maintenance. Access shall be through ceiling tiles, access panels, or other means such as adjustable spindles accessible through the use of tools.

10.6. Pipework reticulation systems (heating hot water and chilled water)

The Contractor shall provide a pipework system based on design parameters relating to pressure drop and velocity ranges listed in the AIRAH DA16 Water Piping.

Systems shall be in accordance with industry best practice standards and shall include isolation and balancing valves at each branch take-off and at each floor (where a multi-storey design is proposed). Pipework installation and pressure testing shall conform to AS 4041.

10.7. Noise and vibration

For specific building services acoustic design criteria refer to Section 15 (Acoustic Engineering). Where specific guidance is not provided, use current guidance from recognised sources such as AIRAH, ASHRAE or CIBSE.

10.8. Refrigerants and refrigeration systems

All equipment using refrigerants shall be selected for zero ozone depleting potential (ODP) and low global warming potential (GWP), with low toxicity and flammability. Refrigerants used shall be Class A1. Under special circumstances, where advantages including exceptional efficiency can be demonstrated, refrigerants of Class

A2L may be permitted by the PAP. All aspects of refrigerant safety and handling shall comply with ARClick requirements

Refrigeration charge limit calculations to AS/NZS 5149 shall be performed for all refrigeration-based units installed, as required by the ARC regulations and/or AC unit manufacturers. Results shall be submitted for review and final certification of compliance shall be issued at Practical Completion.

10.9. Mechanical Services Design Margins

The Contractor shall provide the following allowances (design capacity and spatial) or future expansion within the School:

Table 7 – Mechanical services allowance

System	Sub-division	Allowance for spare capacity
Central Thermal Plant (Cooling or Heating).	Installed capacity	10% spare capacity on diversified demand.
	Space provision	20% spare capacity above installed equipment
	Configuration	N+1 redundancy
Heating and Cooling Water Piping	Installed capacity	20% spare capacity on main headers and 10% on subsequent branches
Pumping	Heating hot water configuration	Dedicated primary pump per thermal plant. N+1 redundancy for secondary
	Capacity	10% spare flow rate with corresponding increase in pressure. Ensure operation within manufacturers recommended performance envelope.
Piping Racks	Spatial allowances	20% spare capacity above design requirement
	Piping	20% spare capacity above design requirement, unless dictated otherwise in systems such as refrigeration, for reasons including oil circulation
Fans	Capacity	10% spare flow rate with corresponding increase in pressure. Ensure operation within manufacturers recommended performance envelope.
Mechanical Services Switchboard (MSSB)	Capacity and other requirements	Refer to Sections 1.6 and 11.7.

10.10. Mechanical services user documentation

Deliverables for Mechanical Services shall include input to O&M manuals and the Building User Guide (BUG), that provide clear and easily understood guidance on all user adjustable mechanical systems, including:

- Table of contents
- Overview of the systems
- User guidance and instructions, including any user controls and after hours operation

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- Simple troubleshooting, identifying abnormal operation
 - Seeking assistance and technical support
 - Manufacturer, model, configuration and features of the product
 - Maintenance and spares

Where appropriate, user instructions published by equipment manufacturers may be used to supplement the operating and maintenance manuals and building user guide. All instructions shall be in English.

The O&M manuals and BUG shall be provided as hard copies (2) (bound and labelled hard ring-binder folder with TOC, and division tags for each item of equipment or mechanical system), and in scanned PDF soft copy. CAD drawing files (as installed) shall be included in soft copies.

11. Electrical Services

11.1. Design Criteria

Electrical services shall be in accordance with the relevant sections of current Territory and Australian Regulations, Standards, and Supply Authority (EvoEnergy) requirements.

11.1.1 Applicable regulations and standards

The work shall comply with all relevant Regulations, Primary Standards and Design Guides, including but not limited to the following:

Note: Should any conflict be noted between the referenced documents, drawings, site specific requirements or other project instructions, this shall be immediately brought to the attention of the Superintendent.

1. NCC- current version.
2. Local Authority Regulations including ACTPSDD and any Fire Authority Requirements.
3. Utility -Electricity Network operator's requirements.
4. MEPS: Minimum Energy Performance Standards.
5. WHS Act 2011.
6. Access Platforms, Walkways, Stairways & Ladders: AS 1657
7. Classification of Fire and Mechanical Performance of Wiring System Elements: AS3013
8. Degree of Electrical Protection (IP Code): To AS 60529
9. Ducted Wiring Enclosures: AS/NZS 4296
10. Electrical Design and Installation: To AS/NZS 3000, including HB 300 and HB301
11. Electrical Cables and Sizing: AS/NZS 5000 and AS/NZS 3008.
12. Electrical Installations- Construction & Demolition Sites: AS/NZS 3012.
13. Electromagnetic Compatibility of Electrical and Electronic Apparatus: To AS/NZS 4251.1 and AS/NZS 61000.6.1.
14. Fire Protection of Penetrations: AS 4072.1, AS 1530.4
15. Generating Sets: AS/NZS 3010
16. IP Ratings: AS 60529
17. Labelling and Identification: AS 1345
18. Lifts: AS 1735
19. Lighting Systems (Internal): AS/NZS 1680
20. Lighting Systems (External): AS/NZS 1158
21. Lighting (Emergency): AS 2293
22. LV Switchboards, Switchgear, Control Gear & Assemblies: AS/NZS 61439, AS/NZS 60947 4.1
23. Safety- WHS: AS 1470, AS 4801
24. Seismic Protection and Structural Design: AS 1170.4
25. Static Electricity: AS/NZS 1020
26. Surge Protection: AS/NZS 1768

27. Verification Guidelines for Electrical Installations: AS/NZS 3017

11.2. General

The electrical services installation shall comprise electrical supply (including liaison with the Supply Authority), consumer mains, metering equipment, main switchboard(s), circuit protection devices, surge protection devices, power distribution services, lighting services (internal, external and emergency), earthing system and infrastructure services. The provision of power factor correction or active harmonic filtration is not mandated, however spatial provisions for these must be allowed.

The Contractor shall consider that certain areas within the School will be used outside of Core Hours and design accordingly for these areas, including appropriate controls (for lighting, security & access, HVAC) and the provision of separate metering. Such areas may include the assembly hall, gymnasium, general learning and teaching areas, library/ learning resource centre, administration areas, specialist rooms and ancillary areas and associated corridors. Such requirements are stated in Part A- Site Specific Requirements.

The design of the electrical services shall take into account the building form, the characteristics of the building, occupancy trends, orientation of spaces, reliability, spare capacity for future expansion and the environments with regards to temperature, moisture, dust, corrosive substances and potential for vandalism and tampering. Safety in design shall also be a key factor, especially in kindergartens and primary schools.

The design, construction and operation of the electrical supply installations shall meet the requires set in *EDIS: Part B - Functional Brief*.

11.3. Incoming Supply and Electrical Substations

The electricity supply to the School shall be taken from the utility electrical network via a sub-station located adjacent to the site or on Site, subject to Evoenergy requirements. The incoming supply shall be trenched underground in a location, that is outside areas identified for future expansion on the Site.

The sub-station shall be located as a stand-alone proprietary unit near the Site boundary and not as an integral part of the School. The sub-station shall be designed and installed in accordance with the Supply Authority requirements.

The power supply to the School shall comply with the following requirements:

- The design load shall be calculated and submitted to the Supply Authority based on the maximum demand assessed for the school plus spare capacity for future expansion. Refer to Section 1.6
- The consumer mains and the main circuit breaker shall be sized for the above maximum demand
- The substation area including the plinth and any enclosure shall be sufficient to accommodate a transformer for the above design load. Note: It is understood that the Supply Authority may install a smaller transformer based on their independent assessment, however the plinth shall be cast for the larger transformer, to enable a larger transformer to be retrofitted with minimal disruption at a later date if necessary
- When submitting the request for the power supply, the contractor shall advise the Supply Authority, that the School will not have gas fired heating, heating would be provided by electrical equipment, therefore the utility providers assessment must factor for a higher electrical load in winter
- sub-station(s) shall be located in strategic locations in relation to the new and future loads to minimise the energy transmission losses
- electrical supply parameters shall be in accordance with the relevant supply Authority regulations and requirements but generally 400/230V +10%/-6%

- incoming high voltage (HV) cable route requirements shall be in accordance with Supply Authority requirements
- maximum total harmonics distortion acceptable for the installation shall not exceed 5% (THDi)

11.4. Supply Authority Metering

Statutory Supply Authority metering at the low voltage entry into the School shall be provided at a location in accordance with the relevant Supply Authority requirements.

11.5. Main Switch Room

The electrical main switchboard (MSB) shall be housed in a dedicated Main Switch Room (or cupboard) located on the ground floor in association with an external wall. The MSB shall not be placed in Computer (Building Distributor) spaces, in functional storage spaces or adjacent to any teaching areas or occupied rooms, to reduce electro-magnetic effects. The Main Switch Room shall be located so that it does not present difficulties for services distribution from adjoining plant spaces or rooms and shall be located to provide economic distribution of power.

The Main Switch Room shall be of sufficient dimensions to accommodate the MSB, with clearance on both ends of MSB of $\geq 1.5\text{m}$ for future extension of the MSB, the installation of power factor correction equipment and/or active harmonic filtration equipment. The access requirements mandated in AS/NZS 3000 shall be maintained.

Vehicular access shall be provided to the vicinity of the entrance doors of the Main Switch Room. A hard-standing area shall be provided for the location of a temporary (mobile) generator (rated for the full capacity of the MSB, including the spare capacity) for use when the Supply Authority power will be disrupted for maintenance or in the event of an emergency supply disruption. An access panel (lockable and normally closed) shall be provided on an external wall of the Main Switch Room, to run the power cable from the mobile generator to the MSB. The MSB shall have a designated link box and transfer switch for the connection of the temporary power supply. The temporary power arrangement shall be included in the SLD, with clear instructions on making the connection, prominently displayed with a laminated sign.

The Main Switch Room shall be of two-hour fire rated construction and contain smoke detectors, with fire engineering strategies that avoid the necessity of sprinklers. The switch room shall be mechanically ventilated (or air conditioned) in accordance with AS/NZS 3000 and AS 1668.2, a temperature sensor (connected to the BMS) shall monitor the space temperature. Make up air for ventilation shall be filtered (minimum G2), door grilles shall not be used, fire dampers shall be provided where required.

The Main Switch Room shall be internally painted (in a light colour), with the floor treated with an epoxy finish, with 'keep clear' areas designated (to clearances as per AS/NZS 3000) and marked on the floor. Signage shall be applied to access doors- "Electricity Main Switch Room". Signage shall be prominently displayed inside the room stating, "Do Not Use This Room For Storage" Emergency lighting, fire alarm sounders and portable fire extinguishers shall be installed.

A laminated single line diagrammatic (including solar PV and the generator link box) and site distribution layout, shall be installed on the switch room wall. The schematic shall be at least A2 size or larger, for legibility.

11.6. Main Switch Boards

The MSBs shall have the following features:

1. Be of modular construction. Metal clad fully welded cubicle design to approved regulations and Australian standards. A minimum of Form 3B type, (Form 3iB is not permitted). Type test certificates shall be provided for the form rating. Fault level shall be determined in accordance with Evoenergy

Service Installation Rules. IP rating shall be $\geq$ IP 42 (IP 55 if the switchroom is sprinklered). Colour shall be orange. MSBs shall be firmly restrained in accordance with NCC requirements for seismic restraints. All cable entry points shall be sealed using proprietary cable glands or other means, sealant alone shall not be used. Access panels shall have Pintle type lift off hinges, escutcheon panels shall be hinged. Install Red/White/Blue phase healthy indicators. switchgear shall be capable of being locked out

2. The MSB, including the main circuit breaker, busbars (and consumer mains) shall be sized for the assessed maximum demand of the School plus 25% spare capacity for future expansion
3. Each switchgear assembly (adjustable functional unit) and sub main shall have a minimum 25% spare capacity, over and above the assessed maximum demand
4. The MSB shall have spare space provided for the connection of at least five additional functional units, including spare space in cableways, representing typical capacity as installed, for the connection of future circuits including power factor correction and active harmonic filtration
5. spares (10% of the installed provision) shall be provided to any protective fuses and indicator lamps
6. Provision shall be made to ensure that any electromagnetic fields generated at the MSB do not leak to adjacent spaces or cause interference to other systems. The maximum electromagnetic field strength in occupied areas shall be governed by the appropriate standards or guidance provided by ARPANSA related to continuous exposure. In the absence of any such guidance, levels shall be limited to a maximum of 10mG
7. Electronic surge protection devices (SPDs) shall be provided to incoming mains, coordinated with the SPDs provided to other switchboards (as described later). All SPDs shall be monitored by the BMS
 - a Coordination Study shall be performed, and full discrimination curves shall be provided from the Supply Authority protective device to the final sub-circuit protection, for review. Switchgear in MSB and other switchboards serving final circuits shall be from the same manufacturer for circuit discrimination and ease of maintenance
8. Switchboard drawings shall include the frame size and ratings of switchgear, as-installed drawings shall include the set values
9. full sized neutral and earth bars shall be provided in all compartments, neutral bars shall be located within the same compartment as the active bars
10. digital multi-function, smart energy meters shall be installed to the MSB as detailed in Section 8 (ESD and Energy Efficiency). Meters shall be connected to the BMS for energy monitoring, at intervals $\leq$ minutes. All meters shall be calibrated and validated in accordance with the NABERS Guideline for Validation of Non-Utility Meters
11. all busbars passing through insulation barriers shall be provided with a secondary layer of insulation on the busbars
12. all switchgear and other equipment shall be identified by durable permanently fixed labels (Traffolyte or similar), clearly marked details of the equipment's function and designation

11.7. Locations for Switchboards (Distribution boards)

- Each building shall have a switchboard, located within the building. Specialised areas shall have dedicated distribution boards (canteens, food technology, materials technology, large computer rooms, MSSBs)
- switchboards shall not require access from within teaching or offices, they shall typically be accessible from common areas or circulation spaces

- switchboards shall be located in appropriately sized, in secure and lockable cupboards, within each building or area served. They shall not protrude into circulation spaces. DBs and cupboards shall be labelled and lockable
- no other services shall be located in or cross over the DB cupboards

11.8. Switchboards (Distribution boards)

The switchboards, including mechanical services switchboards (MSSBs) shall have the following features:

- Metal clad fully welded cubicle design to approved regulations and Australian standards. A minimum of Form 2 when the main isolator is ≥ 200 A, Form 1 when the main isolator is rated ≤ 200 A. Type test certificates shall be provided for the form rating. Fault level shall be calculated, but ≥ 6 kA. Minimum circuit breaker/isolator and bus bar rating ≥ 250 A 3 Φ . IP rating shall be $\geq$ IP 42 (IP 55 if the room is sprinklered). Colour shall be orange. MSBs shall be firmly restrained in accordance with NCC requirements for seismic restraints. All cable entry points shall be sealed using proprietary cable glands or other means, sealant alone shall not be used. Access panels shall have Pintle type lift off hinges, escutcheon panels shall be hinged. Switchboards shall be provided with a lockable door covering all control and protection devices with hinged escutcheon cover. Switchgear shall be capable of being locked out
- distribution boards shall be split into power and lighting sections, with separate enclosed chassis, except when serving small individual areas. Circuits shall be distributed evenly across the three phases
- digital multi-function, smart energy meters shall be installed to the MSB as detailed in Section 8 (ESD and Energy Efficiency). Meters shall be connected to the BMS for energy monitoring, at intervals $\leq$ minutes. All meters shall be calibrated and validated in accordance with the NABERS Guideline for Validation of Non-Utility Meters
- Electronic surge protection devices (SPDs) shall be provided to all switchboards, coordinated with the SPDs in the MSB (as described previously). All SPDs shall be monitored by the BMS
- **Spare Capacity:** switchboards shall be designed to have spare capacity, provide 35% spare capacity for circuit breakers, over design-10% spare fitted, 25% spare. Spare provisions shall include at least two 3 Φ circuit breaker for MSSBs. Provide at least 15% universal I/O across all controllers in each DDC outstation, with 30% spare space within DDC enclosures
- all outgoing circuits from the distribution switchboards shall have circuit breakers (minor control circuits can be fuses)
- **Labelling:** All switchboards shall be labelled with the incoming submain number, rating of the circuit protective devices and the size of the incoming submain. A label shall be provided on the switchboard door indicating MSB numbers, main circuit breaker size, cable size, approximate length, and description of submain. Inside each switch board door, an accurate circuit schedule shall be housed within a proprietary holder and securely fixed. Related lighting power layouts and control diagrams shall also be housed within the distribution board. Labelling shall be Traffolyte, securely fixed to the doors (stick on labels are not acceptable). Safety tags shall be provided to critical circuits which are not to be accidentally turned off
- in dedicated computer rooms, no more than four stations (twelve sockets) shall be powered per Residual Current Device (RCD) with appropriate miniature circuit breaker protection or whatever number of stations is recommended by respective manufacturers so as to eliminate the risk of nuisance tripping

11.9. Power Factor Correction and Active Harmonic Filtration

The installation of power factor correction (PFC) equipment to the MSB is not mandatory, providing that it is assessed by an electrical engineer that the types of inductive equipment installed (such as motors and lighting) will result in a power factor > 0.95 at maximum demand.

Sufficient space shall be allocated in the Main Switch room, including provision for maintenance access. Provision shall be made in the Main Switch Room and the MSB for the connection of power factor correction equipment or active harmonic filtration equipment, should this be required at a later date.

11.10. Check and Energy Metering

The Contractor shall provide the following with regard to metering of electrical systems:

- energy check metering within the distribution system, as stated in Section 8 (ESD and Energy Efficiency), all areas, buildings, systems, and distribution boards
- power factor meters with leading and lagging indicators
- energy meters to all lighting sections of all distribution boards
- energy meters to all power sections of all distribution boards; electronic multifunctional meters shall provide V, A, kW, kWh, Power Factor and harmonic distortion
- energy monitoring /management system software shall be configured to provide results on a monthly basis to an agreed format; all meters shall comply with AS 1024 for accuracy Class 1, with accuracy of $\pm 1\%$ over 20 to 105% working range
- current transformer type metering shall be provided for all loads in excess of 100 Amps, CT protection fuses and shorting links shall be provided. CT and protection devices shall be readily removable for maintenance without requiring shutdown of the electric board
- all meters shall provide data at a maximum of 15-minute intervals
- energy monitoring /management system software shall be configured to provide results on a monthly basis to an agreed format
- meters shall be provided with a high-level interface and connected to the BMS / Monitoring System

The Contractor shall refer to Section 8 (ESD and Energy Efficiency) for a full extent of metering requirements.

11.11. Underground Pits and Duct System

The Contractor shall provide the following with regard to underground pits and conduits to allow for cable pathways between buildings:

- a pit and conduit system between all buildings at the School. The conduits shall be a minimum of 100mm diameter and of the orange rigid heavy-duty PVC type suitable for installation to carry incoming power cabling and sub-main cabling as required by the supply Authority having jurisdiction over the Site
- the conduit provision shall be sufficient for the calculated maximum demand, plus 25% spare capacity to accommodate future growth
- all conduit joins shall be lapped and glued in place to prevent the ingress of water into the conduits
- all conduits installed to a building that has a concrete floor slab shall be installed under the slab, directly to the main switchboard or distribution board they are supplying
- the conduit system shall link to all buildings

- the conduit shall be marked “Power Cabling” along the length of the conduit
- all conduit sections shall have a minimum of two spare draw wires, retained within the conduit
- only pre-manufactured bends shall be used. 90° bends shall not be used
- a pit shall be provided for each change in direction of greater than 45°
- a minimum of one pit every 50m shall be provided or as required to easily install sub-main cabling at a later stage
- lockable metal pits lids, clearly marked “Electrical Services”
- the pit lids shall be such that the lock is vandal proof and not allow the dropping of debris into the pit
- all underground pits shall be of the heavy duty and trafficable type (minimum)
- all underground conduits to be clearly identified above ground with acceptable cable markers
- an underground pit and conduit system shall be provided to the initial and future locations of modular and transportable buildings. A pit shall be provided proximate to the location of each transportable building, with a conduit route back to the main switch room or a designated distribution board that has been sized for future connection of these transportable buildings

11.12. Cable Reticulation

The distribution system between the main switchboard and distribution boards shall be concealed in so far as it is practicable and be accessible for its entire length without disturbing the building fabric. Galvanised cable trays, cable ducts or conduits as appropriate shall be used to carry electrical distribution cables or final sub-circuit cabling.

The Contractor shall provide the following with regard to cable reticulation:

- where high levels of electromagnetic interference exist, shield the offending source, with all areas adjacent to occupied areas shall be less than 2mG maximum or normal school environment levels whichever is the lower
- the maximum volt drop acceptable from the point of supply to the final outlet shall be a maximum of 5%. The design shall consider only the entire circuit length of the cable from sub-station to the final device
- sub-main cabling to be fully supported on cable ladder and/or Unistrut systems
- all cables with their origin and destination within the same building to be run internally
- sub-main cables from the main switchboards to be sized in accordance with the maximum demand calculation based on forecast peak enrolment and forecast maximum transportable building provision
- sub-main cables shall incorporate neutral sized cables the same size as the active conductors or the maximum current generated by the harmonics, whichever is the greater
- take-off boxes shall indicate the circuit protection device capacity and rating. Circuit breakers shall contain adjustable current capacity
- positioned to avoid crosstalk to other cabling systems
- high-capacity power cables shall be located and configured to avoid emitting high levels of electromagnetic interference
- sub-main distribution systems shall use copper only conductors. Aluminium conductors shall not be used

- an electrical earthing bar shall be provided adjacent to each main switchboard
- minimum sized lighting sub circuit 16A with a minimum cable size of 2.5mm²
- minimum sized power sub circuit 20A with a minimum cable size of 2.5mm²
- all outgoing sub-mains shall be tagged at the original and at the local point with the submain number, cable size, approximate length and the originating MSB
- white Thermoplastic Sheathed (TPS) cables shall be provided for lighting circuits
- all cabling systems shall be fully supported over the cable route length via either cable ladders, ladder tray and/or catenaries. Cable ladders and trays shall be designed and sized for all sub-main cabling and cable supported plus 25% spare capacity, over and above that required for Peak Enrolment numbers, with a separate cable support system for each type of functional cabling
- no cabling is to be laid on the ceiling support system, even for inaccessible ceilings
- sub-main cables to mechanical services equipment shall be designed to the full connected load of the mechanical services equipment with the neutral cable sized as the active conductor;
- where cabling supplies critical fire protection equipment, vertical transportation or life support systems, it shall be mechanically protected
- all cabling types shall be segregated from other cabling types (on the basis of low voltage cable, high voltage cable, and communications cable) with each cable type located on separate support facilities

11.13. Permanently Connected Equipment

The Contractor shall provide isolating switches for each item of permanently connected equipment. Isolating switches shall be:

- rated at not less than the circuit protective device
- mounted adjacent to each item of equipment
- flush mounted for internal installations and surface mounted weatherproof for external installations

11.14. Power Circuits

The Contractor shall provide power outlets generally across the School to support the requirements of the Output Specification and the intended functions and user requirements as described in the Functional Brief. This will include power provision (power outlets and isolators) for:

- networked devices including computers, interactive whiteboards, audio visual projectors, display screens, printers, photocopiers, etc.
- tools and equipment in specialist teaching and learning areas (such as technology tools and machines, amplified musical instruments, food technology appliances, etc.
- drama and performance functions (such as drama lighting, public address, music amplification) both indoor and outdoor
- canteen and catering equipment
- internal and external plantrooms (twin 10A IP44 GPOs)
- appliances and powered equipment as detailed in the Functional Brief, Furniture, Fittings and Equipment Specification and FF&E Schedule
- cleaning and maintenance purposes

The Contractor shall provide a power circuit system complying with the following requirements:

- suitable RCD protection against electric shock and circuit overload for all socket outlets
- minimise interference to computers caused by electrical faults or failures
- provision of the appropriate number and distribution of electrical outlets shall be determined by the functionality and flexibility requirements of each space, together with others required for general maintenance and other functions such as cleaning
- all electrical outlet locations shall be considered in relation to positioning them safely away from potential dangers
- where multiple power outlets are required in a space, these are to be distributed around walls, while avoiding designed fitments that will occupy wall space
- in specialist rooms such as the science laboratories, applied science rooms, technology, design studios, etc. power outlets shall be mounted on wall mounted multiple compartment cable ducting, or ceiling suspended outlets, or on benchtop mounted pedestals. This shall be noted on all drawings
- power outlets shall be provided in each teaching space. The Contractor shall provide sufficient power outlets, mounted 300mm above the finished floor level or 150mm above benchtops
- in the pre-school, all power outlets shall be protected with a safety mechanism or located at least 1500mm above floor level
- power outlets within teaching spaces and Learning Communities shall incorporate USB charging outlets
- power and data outlets for ceiling or wall mounted equipment such as data projectors, shall be coordinated with the location of the device
- power outlets and associated services in the physical education halls shall be flush mounted and protected from impact damage
- power outlets and isolators located in change rooms for water heaters, water boiling units and the like shall be suitably rated and switched with neon indicators. Seven-day timers shall be provided in these areas to eliminate standing losses out of Core Hours
- electric hot air hand dryers shall be provided to all toilet areas and wash basin areas as detailed in Section 7.7 of this specification
- in all areas the power for fridges and freezers shall be supplied on a separate circuit, identified at both ends
- all outlets shall be suitable for the intended use, and consideration of the use of outlets by students shall be given
- all cleaners outlets shall be installed on a separate circuit, coloured beige and identified as a 'Cleaners Power Outlet'
- all fume cupboards shall incorporate a double power outlet on the external top or side of the unit

The style of internal switchplates, power outlets and data outlets shall be consistent across all spaces. Internal switchplates, power outlets and data outlets shall not have cover plates or escutcheon plates that can be snapped off.

Every power and data wall plate shall be permanently marked with either the power circuit or the data port/cable number(s). Where labels are adhesive fixed, the adhesive shall form a permanent bond between label and plate.

Provision shall be made on local Distribution Boards (DBs) for isolation of external power outlets.

For a summary of minimum power provision requirements see Table 8 below.

Table 8 – Table of minimum power provision

Space/ Room or Functional Area	General provision of electrical outlets (minimum applicable to each separate space)
General requirements	Where reference is made to provision of power outlets for work stations and powered equipment, the Contractor shall consider the requirements of the Functional Brief, and the FF&E Schedule, and provide power to support its proposed furniture layouts, including additional power provision to support alternative and flexible room layouts. Where a specific space is not listed below, power provision of the nearest similar space is to be used for guidance.
General Learning and Teaching, Learning Communities, Learning Neighbourhoods	Two double power outlets to support each teacher's desk/ work area and four double power outlets distributed around walls in each space. Additional power provision for each item of powered equipment (overhead data projector, electronic whiteboard, etc. – refer to FF&E Schedule).
Smaller learning spaces/ break out/ reading recovery/ 1:1 tuition	Two double power outlets to support teaching and learning equipment, appliances, PC, etc.
P-6 Music, Art	Three double power outlets to three walls, and one additional power outlet (distributed around perimeter walls) for each item of powered equipment (refer FF&E Schedule).
Library	One double power outlet located at each designated student work/ study desk, plus six double power outlets distributed around perimeter walls. Provide the library work area with two double power outlets and one additional power outlet for each item of powered equipment.
7-12 Materials Technology studio	One separate circuit power outlet for each piece of electrical equipment including isolator on the machine. An additional two power outlets for each 3m of bench surface against walls. Power to free standing benches (from above or below). Circuit amperages to be coordinated with equipment requirements. Provide two emergency power shut-down buttons per space.
7-12 Science laboratories, systems studios,	Two double power outlets per student work bench or demonstrator bench (mounted above benchtop on pedestals), two additional power points per wall, one additional power outlet for each item of powered equipment, and two double power outlets per fume cupboard supplied from a separate circuit. Circuit amperages to be coordinated with equipment requirements. Provide two emergency power shut-down buttons per space.
7-12 Food technology	Three double power outlets to three walls, and two double power outlets per student work bench. Additional power outlets for each powered appliance or item of powered equipment (refer FF&E Schedule). Provide two emergency power shut-down buttons per space, reasonably spaced apart and close to exits.
7-12 Science prep rooms	Two double power outlets per wall, plus power outlets for each powered appliance or item of powered equipment (refer FF&E Schedule).

Space/ Room or Functional Area	General provision of electrical outlets (minimum applicable to each separate space)
7-12 2D & 3D visual art, design studio spaces	Three double power outlets to three walls, and two double power outlets per student work bench. Additional power outlets for each powered appliance or item of equipment (refer FF&E Schedule).
7-12 music area/ drama space	Three double power outlets to three walls, and one additional power outlet (distributed around perimeter walls) for each item of powered equipment (refer FF&E Schedule). Four double power outlets per instrument rehearsal room. Where drama space is configured with a stage opening to an audience area, provide 6 double power points at high level to support stage lighting, and configure for operation through a portable mixer board.
School Principal's work area, Senior Personnel work area, Business Manager work area,	Three double power outlets (two at desk/ work area and one above skirting close to seating area).
Conference room/ Counselling/ Interview room,	Two double power outlets distributed around perimeter walls, and one additional power outlet for each item of powered equipment.
Administration reception/ entry foyer	One power outlet to support a networked TV screen/ display panel (location coordinated with the design of the space).
General office	Two double power outlets at each desk/work location and one additional double power outlet for each item of powered equipment (photocopier, fax, IP PBX, PA, security, credit card point-of-sale device, etc.).
Security Store and general storerooms	One double power outlet – located clear of fixed storage joinery and fittings.
Data Communications Rooms /BD space	Power as required for all active equipment. Provision of power to BD Cabinets shall include the provision of Captive Outlets managed by Circuit Breakers at the building DB. These circuits shall be Traffolyte-labelled at the BD Captive Outlet and DB as "Caution: Non-RCD Protected Circuit" . The Captive Outlets are to be installed inside the BD Cabinet at no less than 700mm from the Cabinet finished floor level.
ICT Technician's room	Three double power outlets above work bench and one double power outlet wall mounted on clear wall space. One double power outlet (minimum 20A circuit) for a mobile notebook computer recharging rack.
Staff Lounge	Four double power outlets distributed around perimeter walls, two double power outlets above kitchen benchtops and one additional power outlet for each item of powered equipment (fixed kitchen appliances, loose kitchen appliances, vending machines, etc. - refer FF&E Schedule).
Preschool kitchenette	Two double power outlets above kitchen benchtops and one additional power outlet for each item of powered equipment (fixed kitchen appliances, loose kitchen appliances, vending machines, etc. - refer FF&E Schedule).
Staff work areas (including preschool)	Two No double power outlets at each desk/work location and two additional double power outlet mounted on clear wall space. Power connections for fixed appliances such as gas heater (if used). If the work area is provided with a meeting table, the additional power outlets are to be located adjacent to the table.

Space/ Room or Functional Area	General provision of electrical outlets (minimum applicable to each separate space)
Staff Resource area	One double power outlet located adjacent to each item of free-standing powered equipment (photocopier/ shredder) and additional power outlets for each bench mounted item of powered equipment (binders, laminators, etc. - refer FF&E Schedule).
Staff Toilets and Change Rooms	One double power outlet, near to basin bench/ mirror in change rooms. Power for hand dryers.
Gymnasium / General Purpose Hall	Eight double power outlets distributed around perimeter walls, and one additional power outlet for each item of powered equipment. Provide Gym Store with two double power outlets located clear of fixed storage joinery and fittings.
Student Toilets and Change Rooms	Power for hand dryers (where provided).
First aid	Two double power points above desk, one power point below bench for bar fridge, one additional power outlet for each item of powered equipment and two additional double power points mounted on clear wall space.
Canteen	One double power outlet for each item of electrical equipment – wall mounted for free standing appliances, at high level for bug zapper, and above or under bench for bench mounted appliances (microwave ovens, pie warmers, kettle, steamer, dishwasher, boiling water unit, auto tap, heated display counter, computer, cash register, etc.). Provide direct connections on separate circuits for ovens, exhaust hoods, etc.
External	Provide at least one weatherproof 10 A 1Φ twin GPO to each elevation of each building – located proximate to outdoor sports fields, outdoor performance and assembly areas. Provide one weatherproof 10 A 1Φ twin GPO to each external learning/ project area outside Art and STEM spaces. One weatherproof 10 A 1Φ twin GPO at the external area of the staff lounge. One weatherproof twin GPO to all designated external plant rooms and areas.
Cleaner (separate circuit)	Generally distributed along circulation areas, in Learning Communities and in large spaces. Provide one single power outlet near wet areas, amenities and canteen. Provide power outlets distributed around the gym to allow for coverage of large floor areas. All cleaners outlets shall be coloured beige and labelled 'Cleaners Power Outlet'.
Plant rooms	One 10A 10A 1Φ twin GPO power and data outlet for maintenance purposes, in addition to any power and data requirements required for plant and equipment.
Building Services Officer room	One double power and double data set collocated with the proposed work desk location. One double power point on a different wall above floor level. In addition, power outlets for specific locations of appliances or equipment.

11.15. Requirements on Residual Current Devices (RCD)

The following requirements shall apply:

Requirements in AS/NZS 3000; and

To avoid nuisance tripping, ensure that functional (leakage) current in circuits do not exceed the recommended values in the wiring rules and/or manufacturer's instructions, whichever is more onerous.

In discussion with the Territory, carry out a risk assessment for any areas that may require the provision of 10mA RCDs and areas where the installation of 30mA RCDs could cause nuisance tripping- E.g. Computer Rooms and circuits that supply refrigerators. Apply appropriate risk mitigation measures, including the use of captive socket outlets and safety labelling. (Refer Section 12 – ICT and Telecommunications, for the exemption of RCD circuit breakers on ICT equipment racks inside Comms rooms where captive outlets, lockable cupboards/rooms and appropriate signage is provided.)

11.16. Electric Hand Dryers

The Contractor shall provide hand dryers suitable for a 240 Volt, 50 Hz supply. The noise rating shall be less than 65 dB(A) at 1 meter. Assemblies shall be complete with concealed mounting hardware to suit the wall type. The unit shall be mounted on vibration insulating rubber. The air nozzle shall be swivel type and chromed. A timing circuit which provides time and adjustment to cycles between 30 and 180 seconds, and an automatically reset overload protection circuit shall be incorporated, alternatively, an automatic sensing type may be offered. Hand driers shall be powered via local GPOs.

11.17. Power Emergency Stop

The Contractor shall provide emergency stop (off) push buttons adjacent to each exit door for power supply to specialist rooms such as materials technology, science laboratories and food technology areas. Push buttons shall trip off all power circuits within the respective room / laboratory. The power shutdown button shall be of the 'latched on' type and require unlatching after use.

For science laboratories and food technology areas, the emergency stop button shall not isolate power circuits that serve separate adjacent spaces where power interruption is not needed (for example those adjacent secure spaces containing refrigerators or freezers).

Emergency stops installed to Solar PV shall be prevented from tampering through shielding and/or location.

11.18. Lightning Protection

A lightning protection system shall be provided to protect:

- the occupants
- electrically operated plant and equipment, appliances, ICT and AV devices and the like
- the building itself

11.19. Earthing systems

The Contractor shall provide the following with regard to earthing systems:

- separate Low Voltage (LV) earthing systems shall be employed and cross coupling of these shall be subject to the agreement of the relevant energy Authority
- separate earthing conductors shall be provided with all sub-mains and sub circuits
- earth impedance shall be provided with test results provided on completion
- the earthing system shall provide the ability to connect additional 20%, over and above that required for the design, to allow for future addition of circuits

- all metallic wall framing systems, supporting General Power Outlets (GPOs) or electrical cabling shall be bonded to the electrical earth system to provide equipotential bonded to earth
- all electrical cable support systems shall be electrically earthed
- a communications earthing system associated with the data block cabling system shall be provided
- the reference earth bar shall be pre-drilled to accommodate outgoing cabling

11.20. Lighting Systems

The Contractor shall satisfy the following specification with regard to lighting:

- All internal areas including plant rooms shall be supplied with artificial lighting
- All luminaires (internal and external) shall be high efficiency LED types, sourced from proven production runs with demonstrated performance levels, of good quality and easily maintained
- luminaire selections shall be appropriate to the environment and conditions of their locations. External luminaires shall be weather, insect and vandal at least IP55 Internal luminaires in high moisture environments shall be water resistant
- the specific lighting shall suit the task being performed and shall control luminaire glare
- the lighting and general appearance of the luminaires shall suit the space illuminated
- the lighting design shall contribute to achieving the overall energy performance requirements set in Section 8 (ESD and Energy Efficiency)
- custom made luminaires shall be avoided
- luminaire locations requiring access machinery are to be avoided
- standardisation and minimisation of luminaire types is preferred
- daylight control devices shall reduce artificial illumination when daylight is present
- controls and switches shall be of robust construction
- motion / occupancy sensors shall be used to detect space usage and control luminaires;
- circuit loading to be designed in accordance with the sizing of the control system circuit protective devices and spare capacities
- luminaires enabled with distributed intelligence and the capacity to communicate with adjacent luminaires are to be considered
- linear luminaires in general learning and teaching areas, circulation areas and science rooms shall be of the prismatic diffuser type
- feature lighting for notice boards, display cabinets and other specialist display areas shall be provided in accordance with the design
- shower areas shall be provided with appropriate lighting outside of the shower cubicle. i.e. in the common circulation space
- suspended luminaires shall be rigidly suspended (using fabricated and pre-coated brackets, beams and the like), especially in areas affected by draughts from windows or ceiling fans
- luminaires in high-risk locations (e.g.: gymnasium sports hall) shall be protected from impact damage
- background lighting shall be provided at all external plant rooms to facilitate servicing of equipment

- internal security lighting shall be provided at building entries, changes of direction to external pathways and stairs in corridors
- adequate external security lighting to the perimeter of all buildings shall be provided to ensure safe access. The lighting of pathways, car parks, and roads within the Site shall be provided by the Contractor as a minimum to allow security illumination and the safe passage of all Users
- car park lighting shall be in the form of high-level post mounted luminaires or luminaires attached at high level to walls of buildings facing onto the car park
- lighting spill from external lights shall be modelled and contained to prevent nuisance to neighbours

Table 9 – Tables of illuminance levels

Illuminance levels for P-6 School Functions		
School Functions	Illuminance levels (lux)	Dimmable
General learning and teaching, Learning Communities, Learning Neighbourhoods, library, physical education	240	
Preschool Playrooms and quiet activities areas	240	D
Special needs rooms	240	D and colour change
Toilets – staff, toilets – students, change/shower – staff, change/shower – students, security store, storerooms	150	
School Principal's work area, senior personnel work area, conference room, counselling/interview room, business manager work area, general office, staff lounge, staff resource area, staff workspaces, data communications rooms, ICT technician's room, canteen	320	
Art, music, library	320	
Drama	320	D
First aid room	240	D
Illuminance levels for 7- 10, 7-12 and Secondary College School Functions		
School Functions	Illuminance levels (lux)	Dimmable
General learning and teaching, Learning Communities, Learning Neighbourhoods, library, physical education	320	D
Toilets – staff, toilets – students, change/shower – staff, change/shower – students, security store, storerooms	150	
School Principal's work area, senior personnel work area, conference room, counselling/interview room, business manager work area, general office, staff lounge, staff resource area, staff workspaces, data communications rooms, ICT technician's room, canteen	320	D
Design spaces, science spaces, technology spaces, art, music, library	320	
Drama	320	D
Fume cupboard interiors	400	

First aid room	240	D
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11.20.1 Natural Daylight

The Contractor shall comply with the natural daylight requirements noted in Section 8.4.

11.20.2 Lighting control Systems

The Contractor shall provide a lighting control system to ensure that all lighting is only operational when required or insufficient light is available and to satisfy the following specification with regard to lighting switching systems. These switching systems shall:

- suit the operational requirements of the School;
- zone the luminaires controlled by a single switching control into manageable, logical, functional groups
- consist of a stand-alone (non-networked) hardwired control system with distributed intelligence linked to pre-set control panels time clocks, motion / sensors and daylight control facilities
- clearly labelled as to the lights they serve where multiple switches are provided
- in teaching spaces automatic lighting controls shall be based on manual on/off switching, presence detectors and daylight sensing, so that the luminaires are switched manually on entering and then switched off or dimmed automatically depending on signalling from automatic controls. The lighting shall be zoned to take account of the various daylight influences
- in the teaching areas be arranged so that any natural daylight is maximised and individual rows serving areas where daylight is available can be separately controlled
- have two-way switching at both doors for larger rooms such as libraries which may have two entry points
- provide manual over-ride facilities to any automatic lighting controls
- be of the unbreakable polycarbonate flush mounted type and located adjacent to closing side of the door. Light switches shall not be able to be 'pushed in' from the front of the switch
- lighting switches to any disabled access toilet shall be large format rocker switches for use by people with limited dexterity and strength
- not have cover plates or escutcheon plates that can be snapped off
- be controlled by separate timing devices with manual overrides for external lighting;
- be controlled to provide dimmable and colour shifting functions where specified

11.20.3 Spare Luminaires

Spare luminaires shall be handed over to the school, five fittings of each type, unless there are less than 20 fittings of any type, where one fitting shall be provided for each type.

11.20.4 Emergency and Exit Lighting

Emergency lighting shall be provided to ensure safe evacuation in an emergency and / or in the events of mains failure, to be integrated with escape routes and doors.

The Contractor shall satisfy the following specification with regard to emergency and exit lighting:

- luminaires shall be sourced from proven production runs with demonstrated performance levels

- the system shall contain either a cabled or wireless communication network
 - If wireless communication is to be used, the system must not operate in the 2.4GHz or 5GHz frequencies used by Wi-Fi
- the system shall incorporate central monitoring and testing facilities
- be attractive in appearance to suit the ambience
- the system shall be capable of accommodating additional luminaries anywhere within the systems network
- non-maintained lamps for the emergency lighting function are preferred
- emergency and exit luminaries shall contain a localised battery source of a minimum 10-year life
- battery and control circuitry shall be modular in design to enable quick replacement techniques
- exit signs shall contain 'low energy' lamp sources comprising cold cathodes or LED sources
- the system shall be designed to enable alterations and additions at any point in the network

11.21. Clock Installation

The Contractor shall provide clocks to the School that are:

- fitted with a digital face, showing hours and minutes (not seconds)
- of commercial quality, sourced from a reputable manufacturer with demonstrated performance levels
- where located externally, are resistant to corrosion
- of the centrally controlled type with all clocks corrected from a 'master' clock or a master signal through the internet
- each connected to a Power over Ethernet (POE) system to the SSICT data network and conforming to either the IEEE 802.3af (Power over Ethernet) or IEEE 802.3at (Power over Ethernet+) standards and capable of synchronising time from a Network Time Protocol (NTP) source
- All POE clocks are to be submitted to SSICT for testing and approval prior to ordering

The centrally controlled 'master' clock shall be located in the main communications room (Campus Distributor room). Clocks shall be provided in all teaching areas, administration areas, private offices and shared work zones, meeting rooms, the staff lounge, the library/resource area, the Gymnasium, hall, the canteen, and externally where specified in the Functional Brief. A protective cage shall be installed over the clock in the Gymnasium.

11.22. Photovoltaic (PV) Systems

The ESD requirements include the installation of on-site renewable energy generation, with a preference for PV. The Contractor shall comply the following with regard to any PV installations:

- ensure all cable loops are minimised to reduce the effects of induction;
- all DC cabling shall be double insulated. DC cabling shall be sized to maintain less than 2.5% energy loss with cable sheathing to be UV stabilised or installed in conduit;
- provide weatherproof IP54 (minimum) junction boxes for the termination of all parallel strings;
- PV strings shall be designed to be under 600V, unless the installation includes additional protection measures for strings over 600V – as required by the relevant electrical safety standards;

- the photovoltaic system shall be designed to provide peak load lopping capability. It shall automatically parallel with the utility power system, and disconnect during a power failure to prevent islanding of the supply
- the inverters must each have integrated power monitoring of the DC input and AC output with high level interfacing for central monitoring to the Building Management System (BMS)
- Inverters shall be located and secured to prevent easy access by unauthorised personnel, including intruders, students and staff
- the total photovoltaic electrical system from the DC terminals of the photovoltaic panel to AC output of the photovoltaic array shall be a minimum of 85% overall efficient. This shall include all cable, inverter, diodes and termination losses
- all solar panels shall have electrical module efficiency of minimum 15%

The PV panels power output shall be provided with minimum manufacturer guarantee of:

- 90% of nominal power after 12 years
- 80% of nominal power after 25 years

11.23. Additional electrical service requirements

The Contractor shall provide the following allowances for future electrical expansion within the School, over and above that required for Peak Enrolment numbers and Non-Mandated Community Facilities:

Table 10 – Additional Electrical Service Requirements

System	Sub-division	Allowance for spare capacity
Substations	Capacity	25% spare
	Spatials (transformer enclosure)	50% spare
Main switchboards	Consumer mains, main breaker and bus bars	25%
	Spatials	20% spare
	Cabling–installed capacity	25% spare
	Spatials	25% spare
Low Voltage supply (Horizontal and Risers)	Cabling–installed capacity and volt drop calculations	Light and power - 30%
		Lifts - 15%
		Mechanical - 20%
		Special equipment - 20%
Distribution boards	Board capacity	10% spare (fitted)
		25% spare (space provision)
Cable reticulation	Spare additional capacity	25% spare
Final subcircuits	Circuit capacity	20% spare

12. ICT and Communications Technology

12.1. Structured Cabling Systems

The Contractor shall provide one single structured integrated cabling system (and associated infrastructure). The system shall satisfy the ICT requirements associated with the Functional Brief (Volume 2, Part B) and the FF&E detailed in Volume 2, Part F and shall provide sufficient capacity to satisfy the requirements associated with the Modular relocatable buildings required as part of the project construction and the transportable buildings necessary to satisfy the School's Peak Enrolment. The system shall allow for economic expansion as the School expands and develops should additional buildings be constructed in the future.

The design of the ICT infrastructure shall be integrated into the overall building design, and shall support data, telephony, Wi-Fi, security and building monitoring and control systems.

Refer to the SSICT Technical Specifications- Underground Fibre Optic Cabling System (most current version).

The scope of the term 'communications systems' may be dependent upon the particular design solution proposed, but as a minimum the Contractor shall:

- provide a layout design, incoming cable pathways and structured cabling work to support a Voice over Internet Protocol (VoIP) telephone system installed to all permanent, modular and relocatable buildings. The hardware, software and telephone handsets needed to support the VoIP system will be supplied by SSICT, as will the Uninterruptable Power Supply (UPS) required to support the VoIP system in the event of a power failure
- provide incoming cable pathways for distributed data services across the site in accordance with the system design and requirements of the Functional Brief
- provide the passive infrastructure to support a data Local Area Network (LAN) for the SchoolsNET data and voice network and for the Contractor's network

The Contractor is not required to procure the internet service or provide the active equipment for the SchoolsNET IP network.

The Contractor shall ensure that all structured cabling work is undertaken by a member of the Territory's Supply and Installation of Structured Cabling Systems and Associated Electrical Services panel. The list of panel members is available on the Tenders ACT website.

<https://www.procurement.act.gov.au/supplying-to-act-government/whole-of-government-arrangements>.

The Contractor shall provide an unconditional minimum 20-year manufacturer's warranty for the structured cabling system and an unconditional Defect Liability Period (DLP) of 12 months for the as-installed cabling.

12.1.1 Standards and References

The Contractor shall implement the cabling infrastructure in accordance with whichever is the greater requirement of:

- the latest revision of AS/NZS 3080; or
- Shared Services ICT's *Technical Specification for Building Cabling (Structured Cabling Systems) for ACT Government Directorates*; and
- Shared Services ICT's *Technical Specification for Underground Fibre Optic Cabling*

The cabling design and installation shall also comply with all other relevant Australian Standards and any other regulations of the relevant Authorities having jurisdiction over such works.

This Technical Specification, *EDIS: Part D* takes precedence over any conflicting requirements of the SSICT Technical Specification for Building Cabling (Structured Cabling Systems) for ACT Government Directorates.

12.1.2 System Resilience

Shared Services ICT will supply and install Uninterruptable Power Supply (UPS) units to maintain the SchoolsNET network in the event of an interruption to mains power supply. The UPS will support the infrastructure for a minimum of 30 minutes.

Other Building Management Systems that require UPS support and are critical to the safety and security of building occupants, may be able to be connected to the Shared Services ICT UPS with explicit approval from Shared Services ICT.

12.1.3 Incoming Services

Refer to Section 9.1.6.

12.1.4 Active Data Equipment

The Territory (through Shared Services ICT) will supply the active data equipment including network switches, network routers and Wireless Access Points (WAPs) associated with the School.

Separate active data equipment must not be installed without prior approval from Shared Services ICT. Building Management and monitoring systems (BMS) requiring data network connectivity can be connected to the Territories network with the approval of SSICT.

12.1.5 Services Distribution

The Contractor shall provide a structured cabling system (and associated infrastructure) that consists of a Campus Distributor and multiple Building Distributors, horizontal cabling and data outlets.

The Contractor shall provide ICT cabling and infrastructure to all permanent and modular or relocatable buildings within the Site.

The Campus Distributor shall incorporate the local Building Distributor and the Main Distribution Frame.

The Contractor shall provide:

- fibre optic cabling between the Campus Distributor and each of the Building Distributors
- fibre optic between Building Distributors and pits servicing Modular relocatable buildings and future Transportable buildings;
- Unshielded Twisted Pair (UTP) between buildings if required to support the Building Management System (BMS) control and monitoring functions (noting that UTP to be laid in separate labelled conduit to differentiate copper pathway from optic fibre pathway)
- horizontal cabling and data outlets

The distribution system shall be:

- sized and designed to accommodate the number and the proposed locations of the Transportable Classrooms necessary to satisfy the School's Peak Enrolment
- sized to accommodate a minimum expansion of 25% should additional buildings and facilities be introduced into the School in the future

12.1.6 Horizontal Cabling

The Contractor shall provide:

- structured cabling from distribution points to data outlets. The Contractor shall provide and distribute data outlets to support the requirements detailed in the Functional Brief (Volume 2, Part B) and the FF&E detailed in Volume 2, Part F (Furniture, Fittings and Equipment Specification). This shall include data outlets associated with networked devices including, but not limited to, computers, Interactive Teaching Technology (ITT) devices (e.g. Interactive Flat Panels, etc.), wall mounted ultra-short throw projectors, audio visual RGB projectors, display screens, printers, etc.
- cable pathways in the floor, wall or ceiling in each classroom and teaching space. Cable pathways shall be designed and installed to allow for the installation of additional data outlets in the future

Data outlets shall be correctly IP rated and damage resistant for their installed area and application. The telecommunication outlets shall be fit for purpose and at an appropriate height for the users of the room.

Typically, data outlets shall be installed 300mm above the finished floor level or 150mm above a fixed benchtop, typically aligning with power outlets. Outlets dedicated to specific equipment or functions, including VoIP handsets, shall be located in positions suitable for their intended purpose.

The numbering and labelling scheme of the data outlets shall be agreed with the Territory two months prior to the Contractor commencing the installation of the cabling and outlets. All data outlets shall be permanently labelled with Traffolyte labels or equivalent. Typically, each panel is sequentially identified by a letter.

The horizontal cabling links shall not exceed 90 metres at any point.

All data outlets shall be tested in accordance with the appropriate Telecommunications Industry Association (TIA) or International Organisation for Standardisation (ISO) standard to ensure the permanent link complies with all requirements of the specified category of cable.

Table 11 – Table of minimum data provision

Space/ Room or Functional Area	General provision of data outlets (minimum applicable to each separate space)
General requirements	Where reference is made to provision of data outlets for workstations and networked equipment (such as AV screens), the Contractor must consider the requirements of the Functional Brief, and the FF&E Schedule, and provide data to support its designed locations of work stations and its proposed furniture and equipment layouts, including additional power provision to support alternative and flexible room layouts. Where several Power & Data Sets are required on a single wall, these are to be evenly distributed across the wall. The Contractor is to confirm the proposed mounting height of these Power & Data Sets with SSICT and EDU. This specification excludes the provision of data cabling relating to WAP and VoIP installations. Where a specific space is not listed below, data provision of the nearest similar space is to be used for guidance. In Learning Communities, Specialist Teaching areas, Staff and administration offices, the Contractor must install between 30% - 50% DGPO/DUSBs when DGPOs are specified. Combined USB Output must be not less than 4200mA across both USB ports. Data outlets must generally be collocated with power outlets to support devices and equipment needing both connections.
General Learning and Teaching, Learning Communities, Learning Neighbourhood	Four double data outlets distributed around walls in each space. Additional data provision for each item of networked equipment (refer to FF&E Schedule).

Space/ Room or Functional Area	General provision of data outlets (minimum applicable to each separate space)
	Data outlets distributed through-out for the provision of charging chrome books in dedicated charging trolleys. One charging trolley per Learning Community.
Smaller learning spaces/ break out/ reading recovery/ 1:1 tuition	One double data outlet – adjacent to DGPO.
P-6 Music	One double data outlet per acoustically contained room and two double data outlets for performances spaces.
Art/s	One double data outlet in the space and one single data outlet for each item of networked equipment (refer FF& E schedule)
STEM for Primary Schools	Four double data outlets distributed in the space and one single data outlet for each item of networked equipment (refer FF&E schedule)
Library	Eight double data outlets distributed around student work desks and around the perimeter wall of the library space. One Power and Data set to the service counter, Provide the library work area with one double data outlet and one additional data outlet for each item of networked equipment (photocopier/ printer/ scanner, laptop charging trolley etc.). One double data outlet for the provision of charging chrome books in two dedicated charging trolleys.
Principal's work area, Senior Personnel work area, Business Manager work area,	One double data outlet for each desk/work area and one data outlet for each item of networked equipment e.g. mobile interactive flat panel
Conference room	One data outlet for each item of networked equipment and one double data outlet at the wall near the table
Counselling/ Interview room,	One double data outlet, and one additional data outlet for each item of networked equipment.
Administration reception/ entry foyer	One data outlet to support a networked TV screen/ display panel (location coordinated with the design of the space.
General office	One double data outlet at each desk/work location, plus, one double Power and double Data set per 2000mm length of the service counter, and one additional data outlet for each item of networked equipment (photocopier/ scanner/ printer/ fax, IP PBX, PA, credit card point-of-sale device, etc.).
Security Store and general storerooms	No data outlet required.
Campus Distributor/BD1 space/data communications room	One double data outlet wall mounted above the work bench.
ICT Technician's room	Two double data outlets above work bench and one double data outlet wall mounted on clear wall space.
Staff Lounge	Three double data outlets distributed around perimeter walls. In the Staff Lounge area, also provide a single data point at 1500mm from the finished floor level (for telephone handset). This point must be free from obstruction with 300mm clearance on all sides.

Space/ Room or Functional Area	General provision of data outlets (minimum applicable to each separate space)
Preschool kitchenette	In the Preschool kitchenette area provide a single data point at 1500mm from the finished floor level (for telephone handset). This point must be free from obstruction with 300mm clearance on all sides.
Staff work areas (including preschool)	One No. double data outlets at each desk/work location, one double data provided on clear wall space and one data outlet for each item of networked equipment. If the work area is provided with a meeting table, the additional data outlets are to be located adjacent to the table.
Staff Resource area	One double data outlet mounted above benchtop height. One double data outlet located adjacent to each item of networked equipment (photocopier/ printer/ scanner)
Gymnasium / General Purpose Hall	Four double data outlets distributed around perimeter walls and Two double Power & Double Data Sets at the location specified as the stage area. Provide the Gym Store with one double data outlet located clear of fixed storage joinery and fittings.
First aid room/s	None
Canteen	In the Canteen Kitchen area provide a single data point at 1500mm from the finished floor level (for telephone handset). This point must be free from obstruction with 300mm clearance on all sides. Where an office or administration workbench is provided a single Power & Data Set is to be installed above benchtop height. At the Canteen service bench provide one Power & Data Set each side of the service counter to support cash registers and/or point-of-sales devices.
Plant rooms	One power and data set per room in addition to any power requirements required for plant and equipment
Building Services Officer Room	One double power and double data set in addition to any data requirements required for networked equipment.

12.1.7. Pits and Duct System

The Contractor shall provide a pit and conduit system to SSICT specifications between all buildings and the proposed locations of the Transportable Classrooms. The system shall incorporate a spare capacity of at least 50% should additional cables need to be installed in the future.

All conduits that are installed in a location that has a concrete slab shall be cast under the slab and routed directly to the equipment rack or frame that they are to supply.

The Contractor shall coordinate with Shared Services ICT for the installation of a lead-in pathway from the property boundary to the Campus Distributor (BD1). The pathway shall be used for incoming voice and data services and shall be sized accordingly.

The Contractor shall provide an in-ground pit and conduit system to the proposed locations of the Transportable buildings. A pit shall be provided proximate to the proposed location of each Transportable buildings, with associated conduit routes sized for the maximum anticipated cabling requirement of the Transportable buildings plus a spare capacity of 50%.

The Contractor shall provide a vandal resistant solution.

12.2. Building Distributor Cabinets

The Contractor is responsible for the design and construction of Building Distributor (BD) cabinets, including:

- All in-building power and data cabling
- All on-site in-ground conduits and optical fibre services up to the BD1 cabinet/ Campus Distributor
- BD cabinets, patch panels, Fibre Optic break-out tray, and horizontal and vertical cable management

The same patch panel models shall be consistently used in all BD cabinets.

Access to each BD cabinet shall be from the secure interior of its building. BD cabinets shall be finished with seamless vinyl floor, painted plaster walls and ceiling, and lockable doors with dust seals. Ceiling height shall be minimum 2700mm. Each BD cabinet shall be secure, well insulated and have no direct natural light sources.

Cable risers from BD cabinets to ceiling level shall be neatly contained in metal cable ducting with a removable cover.

BD cabinet spaces shall not contain:

- Any hydraulic services (sinks, taps, drains, sumps, water heaters, vents, condensate drains or the like); or
- Storage not specifically related to ICT requirements.

All accessible sides of each BD cabinet are to be fitted with a bi-lock cylinder keyed to the appropriate SSICT keying system.

12.2.1 Campus Distributor (BD1)

The campus distributor (Building Distributor Cabinet No.1 (BD1)) shall be designed in accordance with relevant sections of the Shared Services ICT specifications. The location chosen for the BD1 shall take environmental and security conditions into consideration but is likely to be in the Administration Building. It shall be designed to provide space for and access to:

- (a minimum of) 2 restricted class 45RU cabinets for Shared Services ICT use side by side, bolted together and with the adjoining sides removed. All copper and fibre services are to be terminated in the one cabinet
- Other systems that support the functions of the school, including but not limited to electronic security, Building Management System (BMS), clock controllers, AV systems and UPS
- Boards or frames for associated active equipment

The Campus Distributor shall be sized to accommodate the active data equipment associated with the School including permanent modular buildings and the Transportable Classrooms necessary to satisfy the School's Peak Enrolment.

The Contractor shall provide a separate communications rack to house active equipment associated with the BMS installed by the Contractor. The Contractor shall provide a separate internet network connection, modem and service account for the purposes of remote on-line monitoring and control of the BMS and any other the Contractor active systems. It is not permissible for the Contractor to use the education network connection for the Contractor purposes such as monitoring, control, data download and the like.

In addition to any architectural, structural or engineering considerations, the design of the BD1 shall meet incoming voice and data needs with regard to the provision of sufficient space to accommodate any

equipment associated with the IP PBX VoIP system and allow staff to work on the equipment in accordance with health and safety guidelines.

The room shall be sized so that there is at least 1100mm clearance in the front of all racks, 900mm clearance space to the rear of the rack and 1000mm clearance to the side of the rack. Any other equipment required to be installed in this space should not impede on that clearance.

The room shall be sized to accommodate a minimum of 25% additional (spare) racks.

Cooling of the Building Distributor Cabinet No.1, sized appropriately for the anticipated heat loads within the room, shall be provided by the Contractor.

12.2.2 Building Distributor Spaces

The Contractor shall provide dedicated BD Cabinet spaces for Building Distributors. The spaces shall be sized such that all electronic services for the building/floor can be installed within these spaces and can be appropriately ventilated and cooled.

The Contractor shall provide a Building Distributor (BD) cabinet for each separate building on the Site. Where telecommunication outlets for a floor/area cannot be served from the Building Distributor, an additional Building Distributor shall be provided.

In buildings where the Building Distributor is to only service 48 data outlets or less, the cabinet may be contained within a cupboard, as long as there is a 1000mm clearance on one side of the cabinet, and there is sufficient ventilation to hold active data equipment including UPS.

The Contractor must provide cable routing and layout management to minimise congestion at entry and exit points to the Floor Distributor and Building Distributor. Cabling to all equipment racks must be concealed.

Access to at least two sides of all racks is required.

12.2.3 BD Cabinets

BD Cabinets shall be located in the Campus Distributor (BD1) and in sequentially numbered Building Distributor (BD) spaces located in other buildings (BD1, BD2, BD3, etc). The Contractor shall provide all BD Cabinets that shall meet the following minimum requirements:

- Restricted Class cabinets bolted to the floor
- minimum 27RU after allowing 12RU space for installation of a UPS, plus minimum spare (vacant) capacity of 5RU
- minimum dimensions 800mm wide x 1000mm to 1100mm deep
 - with the exception that if there is less than 48 data outlets the dimensions may be 800mm x 800mm
- bi-lock key lockable access panel(s)/ doors
- 19-inch internal mounting brackets
- sized to accommodate the active data equipment associated with the numbers and types of telecommunication outlets supported by each rack
- Traffolyte labelled with an identification number (in the format BD n - x , where n denotes the BD number, and x denotes the number of each rack in that cabinet)

BD Cabinets shall be sized to accommodate the ICT requirements of Transportable buildings required to satisfy the School's Peak Enrolment.

The Territory shall have access to all equipment racks at all times.

12.2.4 Patch Leads and Fly Leads

The Contractor shall provide:

- two patch/fly leads for every telecommunication outlet installed

The patch/fly leads shall be of the same category as the structured cabling.

The lengths and colour scheme of patch leads shall be agreed with the Territory two months prior to the Contractor commencing the installation of the cabling and outlets.

The standard colour schemes of category 6A patch cords must be as follows:

- Blue – for standard Data/VoIP connections, MFD
- Yellow – for Security, Lighting and BMS applications
- Red – for Wireless Access Points (WAPs) connection to the switches
- White – for WAP connection to data outlet
- Purple – for third party services, e.g. PoE Clocks, PA Systems, etc.

12.3. Wireless Networking

The Contractor must allow for one data outlet for every 10 students up to the school's Peak Enrolment Number as a budget for the deployment of wireless access points across the site. Shared Services ICT will complete a Wi-Fi design in consultation with the Contractor, to provide sufficient Wi-Fi coverage across the school campus, for both indoors and outdoors.

The Contractor shall be responsible for the mounting of Wireless Access Points, which will be provided by SSICT. Wireless Access Points data outlets shall be installed in readily accessible locations that do not require specialist equipment to access and in locations which do not cause interference or obstruction (e.g.: solid or metallic surfaces directly in front of the WAP). Wireless Access Points shall not be installed within ceiling spaces and shall be visible. White patch leads of no longer than 500mm shall be used to connect the WAP to the data outlet, unless a different colour patch lead provides a better aesthetic outcome.

All data outlets for WAPs shall have a minimum of 3000mm of cable, slack looped up within the ceiling to allow for possible re-positioning in the future. The contractor must ensure that all WAP locations have sufficient noggings and sub structure to support correct mounting of the WAP.

Wall-mounted WAPs shall be installed at a minimum of 2000mm from finished floor level, at a maximum of 2400mm. WAPs shall be installed directly next to their assigned data outlet. WAPs in locations where ball sports are played (e.g. Gym, hall), the data outlet should be concealed within a mounting block.

For ceiling mounted WAPs, if the data outlet is concealed (e.g. within a false ceiling), it shall be properly terminated on or inside a surface mounting block and shall be easily accessible. An additional data outlet label shall be affixed to the ceiling directly below the outlet in this instance. On a fixed ceiling, the data outlet may be installed outside of the ceiling space. In this instance, the WAP is to be mounted directly next to the data outlet.

WAPs shall not be mounted on ceilings above a height of 2700mm from finished floor level.

External wireless access points are outdoor rated and will be provided by Shared Services ICT with appropriate mounting brackets. The data cable must be installed within a flexible UV-rated conduit so that the cable is not exposed to the elements.

WAPs installed within high-risk areas (i.e. areas with ball sports, wet areas, high dust areas) or used by the community after-hours must be covered with a suitable transparent plastic protective enclosure.

No other Wi-Fi systems must be installed by the Contractor without approval from Shared Services ICT. Any other systems requiring wireless technology must operate outside the 2.4GHz and 5GHz spectrums used by Wi-Fi.

All data outlet patch port details and locations of WAPs shall be referenced to a site map and provided to the Education Directorate project manager upon project completion.

12.4. VoIP Telephony Design and Cabling

The Contractor shall design the data layout to ensure that staff are provided with suitable access to the telephony system within teaching and learning areas without having to leave an area or students under their supervision. Administrative and support staff shall be provided with telephone access within their designated work areas or offices. Telephone access shall also be provided in staff workspaces; the staff lounge; and conference, meeting and consulting rooms.

As part of the data network, the Contractor shall provide a data outlet for telephone handsets for each location proposed in its design of the permanent buildings.

Wall mounted VoIP data outlets shall be installed at 1500mm above finished floor level.

12.5. Master Antenna Television System

The Contractor shall provide a master antenna television system (MATV) and signal wiring system to wall outlet plates located at suitable locations in the Library/Learning Resource Centre, and in the Staff Lounge. The MATV system design, installation and operation shall comply with all relevant standards, codes and regulations of the Authorities having jurisdiction over such works.

The system shall provide the best available signal for all free-to-air channels available in the locality. The system shall be fully tested and commissioned, demonstrating suitable reception across all available channels.

12.5.1 Television Antenna

The antenna system shall provide the best possible signal, free of interference, ghosting and other visual or audible impairments. It shall have an adequate bandwidth to receive all transmitted information without affecting the relative levels of individual carriers and ensure that the signal levels off air of different channels are of similar magnitude.

The antenna system shall comply with and be installed in accordance with the relevant requirements of AS 1417 (2015) Receiving antennas for radio and television in the VHF and UHF broadcast bands. Due consideration shall be made for wind loading on the support structure design for the antenna.

12.5.2 Antenna Outlets

The system outlets shall be mounted on wall plates to match the room GPO switch plates in style and colour. Outlets shall be socket type suitable for use with an MATV system and incorporate mains voltage isolation. Cable connections to wall outlets shall be F type co-axial connectors.

12.6. Public Address System

12.6.1 Overview

The Contractor shall provide an IP network based public address (PA) system that covers the School and the Site.

The Contractor shall provide cabling infrastructure, which supports all services being delivered and the active PA system equipment.

The scope of the installation shall include all Transportable Classrooms scheduled for installation on the Site prior to Commercial Acceptance of the relevant School and shall include pre-wiring leads and installation of sealed buried conduits to facilitate extension of the PA system to the locations of future long term and peak Transportable Classrooms.

12.6.2 Standards and References

The PA system design, installation and operation shall comply with all relevant standards, codes and regulations of the Authorities having jurisdiction over such works, including those issued by the Environment Protection Authority.

12.6.3 Functional Requirements

The Contractor shall provide a digital zoned PA system suitable for announcements, media information and music. The PA system shall employ audio distribution and control over the school's IP data network. Paging microphone stations and zone selection controls shall interface with the PA system via the IP network. The PA system shall be capable of directing messages to selected zones, without these messages being heard in other zones. The PA controls shall enable the selection and de-selection of zones in a simple and quick manner. The PA system zone arrangement shall be proposed by the Contractor and agreed with the Territory.

The PA system:

- is the medium to make public broadcasts of routine, situational and important announcements (including tone alarms signalling Lockout and Lockdown events)
- shall provide simultaneous broadcasting of different calls to different locations
- is the medium to broadcast background music (tones) to all or selected locations
- requires an appropriate tone generator to be capable of supporting the schools lockdown procedure
- shall provide an automatic announcement facility for making routine, situational and emergency announcements

All the main functions shall be provided by the PA system. The PA system shall be simple and logical to operate for staff. The PA system shall provide a means to give customised indications for the selection buttons of the call stations. The PA system shall store at least the last 200 fault messages in the memory of the network controller.

The PA system shall only allow one microphone to announce a message on the selected zone. Any other microphone that tries to select this zone, shall not be able to announce their message until the first microphone has de-selected this zone.

The PA system shall be capable of providing a minimum sound level in all normally occupied areas of not less than 75dB(A). The Rapid Speech Transmission Index (RASTI) shall not be less than 0.5 in at least 75% of each area of coverage and shall not fall below 0.45 for the remaining 25% of each area.

12.6.4 School Bell

School bell services shall be achieved using the PA system.

12.7. Audio-Visual Systems

The Contractor is to provide all Audio-visual Equipment and PA to Halls/Gyms.

Where audio visual projection, Interactive Teaching Technology (ITT) devices and display systems are deemed necessary by the Contractor to meet the requirements of the Functional Brief, the Contractor shall:

- define the required locations in the design documentation
- provide cable pathways for audio-visual systems that allow easy post construction installation
- install all cabling in concealed, continuous lengths

The Contractor shall provide and install all connectors, brackets, audio visual wall plates, etc. necessary for the installation of the active audio-visual equipment (including interactive flat panel screens, interactive whiteboards, projectors and powered speakers) which will be procured and installed by SSICT.

Provision shall be made for power and data at 1800mm above floor level in the School reception lobby for the installation (by SSICT) of a digital flat screen display.

The location of audio-visual projectors shall be readily accessible for maintenance purposes and not require specialist access equipment; and shall be positioned to obtain a minimum 100° (diagonal) viewing area.

In addition to the cabling and digital displayscreens that are deemed necessary by the Contractor to meet the requirements of the Functional Brief (Volume 2, Part B), the Contractor shall provide cabling and telecommunication outlets for digital displays in the circulation and foyer areas.

12.8. Intruder Alarm System

The intruder alarm system is to be connected to the school's IP network. This connection shall be made through an Ethernet IP connection and have a cellular backup. The Contractor shall provide the necessary data connections, and connect and configure the intruder alarm system, in consultation with SSICT and the incumbent security monitoring company.

The Intruder Alarm System shall be connected to the BMS to indicate a common fault condition, including any faults from UPS.

12.9. Emergency Warning and Intercommunication System

The Contractor shall install an EWIS where required by the NCC. The EWIS shall be capable of automatic voice messaging and manual announcements from trained fire wardens. The Evacuation Control Panel shall receive a signal from the Fire Alarm Control Panel upon a general fire alarm and transmit the evacuation signals through the buildings. Only the area immediately affected by a fire will receive the evacuation alarm, the balance of the complex shall be warned of an impending evacuation.

The system shall be installed complying with the requirements of the applicable codes and standards

The system shall include:

- Evacuation Control Panel
- installation of speakers, for the purpose of enabling orderly evacuation of the building in the event of an emergency

- a network of signposted warden intercom phones, in secure metal cabinets (if required to comply with relevant standards)
- ceiling mounted speakers installed in all finished ceiling areas and speaker horns in all non-ceiling areas
- sufficient speaker power to achieve a minimum average volume of +75dB over the floor area
- speaker horns and visual warning devices in all plant areas and services areas throughout the building where ambient noise levels exceed +75dB

12.10. Hearing Augmentation

If the Contractor's design of the School's service/ reception counter includes screens that separate the user from the service provider, the School shall be provided with a hearing augmentation system that complies with the requirements of the NCC (Part D3.7).

The Contractor shall provide a hearing augmentation system in accordance with the requirements of the NCC and relevant Australian Standards. The hearing augmentation system (Audio Frequency Inductive Loop System) shall be installed at the School Office service counter, in any spaces in the Contractor's design intended to be the venue for public and school assemblies, in one Learning Neighbourhood per Learning Community and in the Learning Resource Centre/Library and specialist learning areas e.g. music room. If Learning Neighbourhoods have a space intended for videoconferencing, it will be the space where the hearing loop is required. Loops installed in adjacent rooms shall be designed to maximise coverage and limit spill into any other space.

The Contractor shall install a "listening point" style amplification system in each Learning Neighbourhood, complete with all system software and hardware including a microphone per Learning Neighbourhood. The "listening point" system shall be adaptable to permit multiple users and a range of BYOD listening devices. It shall not be a single select / closed proprietary system that will operate using only one style/brand of personal listening device.

13. Hydraulic Services

The Contractor shall provide a hydraulic service system as described below.

13.1. Design Criteria

The hydraulic services shall satisfy the requirements of Icon Water Limited and the requirements of the Territory and Municipal Services Directorate.

13.1.1 Applicable Regulations and Standards

The work shall comply with all relevant Regulations, Primary Standards and Design Guides, including but not limited to the following:

Note: Should any conflict be noted between the referenced documents, drawings, site specific requirements or other project instructions, this shall be immediately brought to the attention of the Superintendent.

1. NCC- current version: Including the Building and Plumbing Codes of Australia.
2. Local Authority Regulations including ACTEPD and any Fire Authority Requirements
3. Utility (Electricity, Gas, Water- mains, stormwater, sewers) and Network operator's requirements.
4. MEPS: Minimum Energy Performance Standards.
5. WHS Act 2011.
6. Access Platforms, Walkways, Stairways & Ladders: AS 1657
7. AS/NZS 3500.1:
8. AS/NZS 3500.2:
9. AS/NZS 3500.3:
10. AS/NZS 3500.4:

13.2. Water services and Sewer System

The Contractor shall provide domestic hot and cold-water services, recycled-non-potable water, irrigation water and the sewer systems including trade waste, to accommodate the Peak Enrolment Numbers, Non-Mandated Community Facilities and other design parameters for the School, to meet the requirements in the Functional Brief.

13.2.1 Potable Water Services

The water supply system design shall:

- be of Grade 2 alternative supply type in the form of mains pressure directly served from Supply Authority mains;
- each domestic water tapplings from the mains shall extend individually to the Site complete with all necessary isolation valves, strainers, backflow prevention, metering, pressure limiting and pressure relief valve systems and be interconnected at the boundary of the Site with appropriate control valve in accordance with the requirements of the Icon Water Limited
- where the water supply is inadequate for domestic water supply purposes an alternative supply comprising storage tanks and booster pumps shall be installed. Domestic water supply pumps of sufficient capacity shall be installed to supplement water supply pressure where inadequate pressure is available. Supply pumps shall be sized for 120% of maximum simultaneous demand. Bypass lines shall be installed around storage tanks and pumps, for maintenance purposes

- provide additional valved potable water supply points, sized appropriately, to within 40m of proposed locations, to allow for the installation of Transportable Classrooms at a later date
- provide valved potable water points to allow for the temporary connection to mobile vans such as dental vans and the like

13.2.2 Non Potable Water Services

The School shall be provided with a separate pipe system for reticulation of non-potable water, taken from source (either reticulated neighbourhood supply or rainwater reclamation tanks) and serving identified points of use (including toilet and urinal cisterns and external garden watering and irrigation). Where reticulated reclaimed water is available this shall be used for non-potable purposes and shall be separately metered. The non-potable water system shall comprise the following:

- rainwater harvest systems shall be designed with filtration and disinfection to remove health risks from water spray or accidental ingestion, and ensure water clarity is satisfactory
- safety warning signage shall be installed on all controllable points of use
- backflow prevention valves to prevent cross contamination with the potable water supply
- storage tanks installed for flush valve supply shall have 100% capacity plus domestic water make-up, based on tanks assumed empty
- automatic change-over to potable water supply if the non-potable supply is in-operative

Refer also to Section 8.5 and 3.2.9 for requirements regarding use of non-potable water.

Rainwater shall not be recycled from sources other than roofs, such as from paved areas or tarmac, where the water could be contaminated. Recycled rainwater shall only be used for the purposes of flushing toilets, irrigation and hose outlets for external washdown.

13.2.3 Pipework, valves and fittings

The Contractor shall provide pipe work, valves and fittings that allow for the following:

- valves and fittings shall be located to ensure control of supply to all buildings, control all sections of the ring main for shut down for maintenance and enable for new branches to be 'cut in'. Valves shall be selected to be capable of 1.5 times the working pressure of the systems;
- service valves shall be located where the risk of tampering by users and / or visitors is minimised. Valves shall be installed at a safe working height above in locations that meet all relevant OHS Legislation, principles and guidelines and appropriately labelled;
- The mains water isolation valve to the site and each building shall be clearly marked on layout drawings and prominently labelled.
- valves shall be provided to on all systems to permit the isolation of supply to rooms, wet areas and groups of outlets, as well as each individual point of demand, fixture, item of Plant and equipment, etc. All external taps and drinking fountains shall have in-line isolation valves to facilitate maintenance;
- maintain water pressure between 250–500kPa at each item of Plant equipment, fixture outlet and point of demand as a general minimum requirement;
- minimise differences in cold and hot water pressure at any item of Plant or equipment, fixture and / or outlet to $\pm 50\text{kPa}$;

- supply shall be calculated to provide flows and pressures in accordance with the Institute of Plumbing Australia – Selection and Sizing of Water Piping Systems guidebook and with pipe sizing based on a maximum water velocity at design flow of 2.0 m/s for cold water pipes and 1.5 m/s for domestic hot water. Pipes shall be sized to deliver 20% spare capacity at the design velocity.;
- pipes shall be supported to reduce structure borne noise levels and lagged to provide protection to piping from elements or damage with compliant acoustic and thermal properties; and
- pipe work shall not be cast-in concrete and water pipe work shall be designed to eliminate any risk of “blue water”.

13.2.4 Tap outlets and fixtures

The Contractor shall provide all necessary tap outlets and fixtures as described within Section 5 (Building Fabric).

Tap outlets and fixtures shall meet the minimum water efficiency requirements as outlined in Section 7.5.1 (Water consumption – sanitaryware and tapware).

All irrigation systems shall comprise subsoil drip systems with automatic timers and soil moisture sensor control override or alternative systems that meet the requirements and standards set out in the Services Specification.

There shall be a general distribution of external taps for garden watering, irrigation and general School use.

13.2.5 Acoustic requirements

The requirements in Section 15- Acoustic Engineering shall be complied with.

13.2.6 Water storage

The system shall incorporate the following where storage tanks are required to be installed:

- storage tanks for both potable and / or non-potable water supplies, shall be duplicated and each tank shall have capacity to meet 50% of the design load volume / capacity, based on Peak Enrolment numbers and Non-Mandated Community Facilities numbers plus 20% spare capacity;
- potable storage where required to be installed due to in-adequacy of main supply shall be sized for minimum of 24 hours of supply;
- infill supply for each tank shall comprise a high-pressure ball float valves for each supply; and
- storage tanks shall be constructed in durable high impact material of potable water supply quality heavy duty PVC, galvanised or epoxy coated steel or reinforced concrete tanks may be installed and fitted with heavy duty liner specifically designed for potable water.

13.2.7 Potable and non-potable pressure boosting pumps

The system shall incorporate the following:

- pump sets shall comprise dual multi-stage variable speed (through integrated VSDs) constant pressure pumps of 316 stainless-steel construction connected in parallel with 316 stainless steel inlet and outlet manifolds, in-line strainer and isolating valve for each pump;
- pump sets shall be rated for the designed system demand plus 20% spare capacity for future use. Capacity shall be limited to design, with the ability to increase settings later.

- o pump sets shall be supplied by manufacturers that have a history of reliable local technical support and spare parts retention;
- o in-line strainers and isolation valve on each pump for maintenance and non-return valves for pumps operating in parallel;
- o duplicate diaphragm tanks to prevent short cycling, anti -vibration mounts on each pump and pipe connections; bypass valve assembly;
- o positive suction head;

Control panels shall be touchscreen programmable logic controllers (PLC) interface mounted on front panel showing operational and alarms status, having the following features;

- o protection for overloads, phase failure, phase rotation reversal, short cycling, low pressure, high pressure, dry running;
- o duty/standby or lead/lag cycling with wear share and manual override;
- o emergency stop button;
- o volts, current, kw, run, fault status;
- o interface to the BMS for run/fault status monitoring;
- o Electro Magnetic Compatibility (EMC) including Radio Frequency Interference (RFI) and Harmonic filters to each pump and screened cables from VFD to pumps.

13.3. Heated Water

13.3.1 Domestic Hot water

Generally, provide a reticulated hot water supply to wash and cleaning fixtures used by adults, including staff and public hand wash basins, sinks, showers, laundry troughs, cleaner's troughs and the like, and to appliances that require direct connection to hot water (which, depending on the School project and the selection of specific appliances, may include clothes washing machines, dishwashers, laboratory glass washers, and the like).

Heated water shall not be reticulated to sinks and hand basins normally accessible to primary school students.

In secondary schools, heated water is to be provided to basins, sinks and wash fixtures in all areas except hand wash facilities in student toilets.

The heated water piping system shall incorporate the following:

- flow and return circulating loops extending from central hot water plant systems aligned throughout building to ensure that pipe dead legs to outlets do not exceed five metres in length;
- single leg systems extending from stand-alone hot water generation systems;
- hot water supplies shall be generated and delivered through main pipelines at a minimum of 60°C to inhibit the growth of legionella bacteria;
- maximum supply temperature of 45°C shall be provided at all outlets used for personal hygiene purposes including all other outlets that are likely to be used where temperature control is required to minimise the risk of scalding to users. Thermostatic mixing valves (TMVs) shall be used;
- maximum supply temperature to outlets of 50°C may be provided to other areas where a minimal scalding risk may be demonstrated, or a higher temperature is required for delivery purposes;

- warm or tepid water systems may be considered subject to adequate legionella controls being installed as part of the installation;
- domestic water supply pumps of sufficient capacity shall be installed to supplement water supply pressure where inadequate pressure is available. Supply pumps shall be sized for 120% of maximum simultaneous demand;
- The Contractor shall provide wall-mounted or under bench boiling water units as appropriate, with capacity to suit the particular application and featuring a time clock device for energy efficiency. Boiling water units shall have a five litre maximum capacity. Boiling water units are for hot drinks for staff areas and other areas not normally accessible to children and deliver water at 95 °C; and
- All boiling water units shall be energy efficient and gas units shall have a Five Star Rating Energy Label or better. Timers for shut down on holidays, weekends, night-time and curriculum days shall be considered.

13.3.2 DHW Generation systems

The Contractor shall determine the most suitable method of generating heated water systems for the Site, which may be one of the options below:

- centralised storage systems with heat pumps, electrically boosted;
- centralised storage systems with solar hot water panels, electrically boosted;

Note: base heating plant shall be sized to provide full capacity without solar contribution.

- stand-alone (small storage) electric systems, including under-sink systems for single and/or remote points of use.;

Note: Gas fired generation systems or instantaneous electric systems shall not be used for domestic hot water.

Regardless of the system selected, 20% spare heating and storage capacity shall be provided in the design that shall be based upon Peak Enrolment numbers, code, and product requirements.

The use of electric instantaneous systems (which create high electricity demands) shall be limited to small individual end uses, drawings typically less than 9kW electrical demand per school.

All external hot water plant shall be provided with appropriate protection to prevent injury or theft.

13.3.3 BMS Connections

The Hydraulic systems shall have the following connections to the BMS:

- a. Water meters to utility supplies and sub-metering. Refer to Section 8- ESD.
- b. Gas meters to utility supply and sub-metering. Refer to Section 8- ESD.
- c. Domestic hot water flow and return.
- d. Status and Fault signals from boost pumps, sump pumps and sewer pumps.

13.3.4 Pipework valves and fittings

The Contractor shall provide pipe work, valves and fittings that allow for the following:

- valves and fittings shall be located to ensure control of supply to all building control also enabling new branches to be 'cut in'. Valves shall be selected to be capable of 1.5 times the working pressure of the systems;

- service valves shall be located to minimise the risk of tampering by users and / or visitors. Valves shall be installed at a safe working height above in locations that meet all relevant OHS Legislation, principles and guidelines and be appropriately labelled;
- valves shall be provided on all systems to permit the isolation of supply to rooms, wet areas and groups of outlets (as well as each individual point of demand, fixture, item of Plant and equipment, etc.);
- maintain water pressure between 250–500kPa at each item of Plant or Equipment, fixture outlet and point of demand as a general minimum requirement;
- minimise differences in cold and hot water pressure at any item of Plant or Equipment, fixture and/or outlet to $\pm 50\text{kPa}$;
- supply shall be calculated to provide flows and pressures in accordance with the Institute of Plumbing Australia – Selection and Sizing of Water Piping Systems guidebook and with pipe sizing based on a maximum water velocity at design flow of 2.0 m/sec for pipe work. Capacity shall meet Peak Enrolment numbers load plus 20%;
- temperature control valves / thermostatic mixing valves installed where supplies shall be delivered at 45°C and with tempering valves acceptable in other areas;
- the system shall include the capability of measuring and confirming circulating pump water flows on each return loop and the return from each building level to validate adequate circulation;
- all main pipework reticulation shall be fully accessible;
- isolation and balancing valves shall be provided on all systems; and
- where heated water systems are to generate and deliver a warm water system, ultraviolet disinfection and other similar measures shall be installed that are considered acceptable legionella control systems for warm water delivery.

13.4. Sewer and Sanitary Plumbing

13.4.1 General

The Contractor shall provide a sewer and sanitary plumbing systems to accommodate the Peak Enrolment numbers and Non-Mandated Community Facilities of the School.

13.4.2 Sewerage system

The Contractor shall provide a sewer system that allows for the following:

- the sewer system shall be based on gravity design wherever possible, with the pipework incline beginning from outlier buildings and the most remote of planned future Transportable Classrooms;
- the sewerage drainage system shall discharge to the Site boundary and connect to the Authority connection point via a boundary trap or other approved Authority device;
- where sewer drains cannot gravitate to the boundary point, a local pump well system shall be installed complete with dual sewerage pumps of sufficient capacity to suit the volume to be discharged. The pumps shall operate in automatic reciprocal duty. The pump discharge shall be directed via pressure line to the Site boundary point or other gravity drain with sufficient capacity for the discharge from the pump chamber;
- sewer drains to be sized to meet the Peak Enrolment numbers and Non-Mandated Community Facilities numbers plus 20% spare capacity;

- main drains shall be ventilated to atmosphere in locations that do not cause nuisance to Users;
- inspection openings for maintenance purposes;
- inspection openings under pavements shall be made with inspection shafts;
- inspection openings at the end of each pipeline in each building shall be extended to surface level with sealed risers to act as clear out points that shall be located in accessible locations to allow clearing of blockages with minimum disruption to the operation of the School;
- inspection chambers to the sewerage systems at the end of lines outside buildings, at changes of direction and at regular intervals for cleaning and maintenance purposes;
- additional sealed branches and system adequacy to allow for the future installation of Transportable Classrooms to accommodate Peak Enrolment numbers; and
- sealed drainage points to allow for the temporary discharges from transportable buildings such as dental vans and the like.

13.4.3 Sanitary plumbing and sewerage system

The Contractor shall provide a sanitary plumbing system that allows for the following:

- sewer stacks and water risers located to ensure that a gravity connection can be made to a stack or waste pipe riser from any part of the floor. The gravity connection shall consider gradients of pipes avoiding services and structural obstructions;
- a minimum pipe size of 150mm diameter for the dedicated connection of water closets;
- shower outlets shall be a minimum of 100mm in diameter;
- all sewer stacks shall be fitted with at least one branch connection at each floor level as low as possible in the false ceiling (where multi-storey construction is proposed);
- sewer stacks (including stacks only serving sullage fixtures) shall be not less than 100mm diameter;
- connect ground and above ground fixtures that are unable to be connected by gravity to the Authority sewer to dedicated ground level and above sewer pump stations; and
- sewerage stacks shall be located against structural elements such as columns.

13.4.4 Pipework and fittings

The Contractor shall provide a pipe work and fittings system that allows for the following:

- an overflow relief gully for each major building with vandal proof hose tap above to enable charging;
- all sanitary drainage pipework shall be acoustically treated when passing through sound sensitive areas;
- air admittance vents may be utilised however, each stack shall be fitted with a vent to atmosphere finishing above the highest roof level of the building served;
- vents shall not be flush with or at the building façade
- tundishes shall be visible for inspection.

13.4.5 Sewerage treatment system

The Contractor shall provide a sewerage treatment system that allows for the following when Authority sewers reticulation systems are not available:

- where an Authority sewerage system is not available provide a sewerage treatment facility;

- the plant and system shall be of sufficient capacity to cater for the entire sewerage volume that may be generated from the Site;
- the treatment plant shall include all necessary chambers, filters and the like to ensure that the sewerage discharge is treated correctly; and
- discharge from the plant shall outfall via appropriate measures that comply with all requirements of the local council and EPA.

13.5. Trade Waste System

13.5.1 General

The Contractor shall provide a trade waste plumbing system to accommodate the Predicted Peak Enrolment and Non-Mandated Community Facilities of the School.

13.5.2 Trade waste system

The Contractor shall provide a trade waste system that allows for the following:

- be based on gravity design wherever possible, and shall consolidate multiple sinks and fixtures;
- pipe work formed in suitable materials to meet the discharge requirements;
- pipe work requiring an acoustic rating shall be acoustically lagged to meet the requirements;
- pipe work shall not be cast-in concrete;
- acid wastes from laboratories shall discharge to externally located neutralisers equipped with automatic electronic chemical analytical dosing plant for acid waste treatment prior to discharge to the trade waste system;
- capacity shall meet design load plus 20%;
- all graded wastes shall be fitted with 'full-way' inspection openings and where concealed, shall be accessible through access panels;
- duplicate pumps where pumps are provided for chemical dosing and the like;
- pumps arranged to allow isolation or removal without disruption to the operation of the system; and
- accessibility to allow clearing of blockages with minimum disruption to the operation of the School. Access panels for maintenance shall not be located in teaching or administration areas.

13.5.3 Trade waste apparatus

The Contractor shall provide a trade waste system apparatus that allows for the following:

- neutralising tanks as 'treatment' apparatus in lieu of mixing tanks. Locate in dedicated plant room or other secure locations for maintenance purposes;
- grease and chemical treatment apparatus;
- a common apparatus only for groups of smaller facilities. Incorporate automatic hot flushing facilities for installation where grease drains are in excess of 30m to the grease trap arrester; and
- separators to minimise the risk of extraneous material entering the waste system.

13.5.4 Pipe work and fittings

The Contractor shall provide a pipe work and fittings system that allows for the following:

-
- accessibility to allow clearing of blockages with minimum disruption to the operation of the School
 - incorporate the principles for the installation and location of stacks as described for sanitary plumbing and sewerage system and sewerage infrastructure system
 - incorporate the principles for pumping and overflow relief as described for the sanitary plumbing and sewerage system and sewerage infrastructure system
 - incorporate ejector pots protected with epoxy coating or constructed in appropriate stainless-steel material, serving acid wastes and wastes detrimental to cast iron
 - air admittance valves (AAVs) shall not be installed in trade waste installation where chemicals are to be discharged

13.6. Controls

The Contractor shall ensure all hydraulic Plant and Equipment, controls and meters are connected to the BMS to enable remote monitoring and control of the hydraulic systems.

14. Fire Systems

14.1. General Requirements

The Contractor shall provide fire protection systems to the School, which are fully compliant with the NCC, Australian Standards and satisfies the requirements of the ACT Fire and Rescue (ACT FRS).

Fire protection systems shall allow for the expansion of school development on the Site necessary to accommodate Peak Enrolment.

All fire systems shall be appropriately designed to minimise intentional misuse of the fire systems and fire protection equipment.

14.1.1 Water Supply

The Contractor shall provide water supply to meet the following requirements:

- water supply shall be of Grade 2 mains pressure supply as a minimum extending from Icon Water Limited mains complete with interconnected supplies as described under Section 13.2.2
- the fire hydrant service for the Site shall be fed from the mains and supply and installed as a ring main
- where water supply is inadequate for fire water supply purposes an alternative supply comprising storage tanks and pumps shall be installed
- storage tanks shall be of the minimum capacity to satisfy the required flows and shall not be reduced in capacity based on infill flow rates
- bypass lines around storage tanks and pumps shall be provided
- all fire system test water shall be reused where possible

14.1.2 Suction and booster system

The Contractor shall provide to each system a booster and suction outlet connection that that will be connected to provide booster of the system by fire brigade appliances, complete with an appliance hardstand area if the booster assembly is not adjacent to a public road.

14.1.3 Pipe work, valves and fittings

The Contractor shall provide pipe work, valves and fittings that allow for the following:

- construct a Site ring main pipe work system to provide reliability of continuity of supply
- valves and fittings shall be located to ensure control of supply to buildings, all hydrants and hose reel outlets, enable shutdown all sections of the ring main for maintenance purposes and enable new branches to be 'cut in'
- hose couplings be compatible with relevant ACT Fire and Rescue requirements
- provision of all necessary signage and notices

14.1.4 Fire hydrants

The fire hydrant system shall incorporate the following:

- providing external hydrants that comprise external dual head individually controlled outlets, with access for a fire appliance to connect to the hydrant

- hydrants shall be installed at suitable locations to provide adequate hose coverage to all buildings with consideration for minimal safe distance requirements from buildings and appropriately located so they are not a safety hazard around play areas, near pathways or other parts of the Site. Internal hydrants shall not be installed
- consideration may be given to the use of street hydrants where appropriate and agreed with ACT Fire and Rescue
- external hydrants shall be appropriately secured to prevent unauthorised use
- external hydrants located near sports fields and active play areas present an injury hazard to running students, and shall be contained in metal cabinets
- external hydrant placement and coverage shall consider possible and planned Transportable Classroom locations

14.1.5. Fire hose reels

The Contractor shall provide internal hose reels where required, and individually controlled outlets installed within a cabinet to suit building architecture. Hose reels shall be located adjacent to building egress and other suitable shortfall locations to provide adequate protection. Fire hose reels shall not be provided in external unsecured areas. The fire hose reel service shall be metered to enable monitoring of use.

14.1.6. Fire extinguishers

The Contractor shall install fully charged handheld Standards Australia approved fire extinguishers on purpose mounting brackets throughout the buildings to the requirements of all applicable codes and standards. Select the portable extinguisher capacity and extinguishing agent to suit the risk being protected, and to meet authority requirements (including the ACT Fire Brigade). Installation includes provision of and installation of appropriate extinguisher location signage and use instruction signage.

14.1.7. Fire blankets

The Contractor shall install fire suppression blankets proximate to any stove or cooking appliance. Installation includes provision of and installation of appropriate fire suppression blanket location signage and use instruction signage.

14.1.8. Smoke detectors and sound alarms

The Contractor shall provide smoke detectors and sound alarms (incorporating ISO emergency signals) to not less than the minimum requirements of the BCA and the relevant Australian Standards.

Thermal detectors shall be installed in locations where normal activities may generate false alarm signals at smoke detectors.

The Contractor shall ensure that the fire detection and alarm system is capable of extension to accommodate future Transportable Classrooms.

14.1.9. Smoke and Fire Doors

Magnetic hold-open devices shall be provided to smoke and fire doors where these doors are placed across circulation corridors or in locations where students and staff shall regularly pass. These devices shall be controlled by an AS 1670 compliant fire detection and alarm system, and automatically deactivate on a fire alarm signal. Self-closers shall be installed to data communication rooms.

14.1.10. Fire Indicator Panel

Where the Contractor proposes to install fire indicator panels (FIP), they shall be analogue addressable type, comprising a Site master FIP and sub-building mimic panels in outlier buildings.

Each FIP shall have a minimum provision of 10% spare capacity to allow for future changes and possible additional circuits. Every FIP shall identify all connected alarm circuits and shall be equipped with auto testing and check alarm facilities.

The FIP shall have an interface to the BMS to report any fault condition with the hardware. This shall be independent, and not interfere with, any connections to the remote monitoring centre.

15. Acoustic Engineering

15.1. General

This section details the acoustic performance standards and requirements that the Contractor shall meet for the School and for the spaces provided. Students who cannot clearly understand speech in a classroom tend to lose concentration and eventually become disconnected with the proceedings. Valuable teaching time is lost and student progress is impaired. The acoustic environment is now regarded internationally as one of the prime considerations in the design of new classroom facilities.

Acoustic design advice must be provided by a suitably qualified person. A suitably qualified person is a person that is a Fellow or Member of the Australian Acoustical Society (AAS) with experience in building and architectural acoustics, who has specific experience and a clear understanding of the design of school environments. Where possible, prior experience with design of school environments must be included.

Note: Due to the complex nature of acoustics, especially in open plan collaborative type spaces, this section includes a certain amount of commentary and technical guidance, which shall not be considered as technical direction. It is essential for the Contractor to engage the services of a professionally qualified and skilled acoustics consultant to achieve the aims of the project. Also important is to communicate the acoustics recommend across the different disciplines (and trades) and to ensure coordination.

The Contractor shall ensure the appropriate level of acoustic comfort relative to the function and use of spaces.

The acoustic performance of the Facilities shall:

- control sound transfer between spaces;
- control room reverberation (including echoing) within spaces; and
- control ambient noise levels arising from mechanical plant, hydraulic fixtures, equipment or external noise (such as transportation).

Acoustic design considerations that the Contractor shall take into consideration include:

- the construction of internal walls that divide rooms;
- the type, weight, positioning and acoustic sealing of doors;
- the surface treatments of walls, floors and ceilings within learning spaces as well as in areas adjoining learning spaces;
- the treatment and design of air ducts or other ventilation paths that connect spaces; and
- the attenuation by design of noise intruding into learning space from mechanical services, hydraulic fixtures, other equipment (e.g.: photocopiers, shredders, etc.), or external sources such as motor traffic (including buses and heavy transport), aircraft, or rainfall onto the roof of the buildings.

For general learning and teaching spaces the requirement includes providing an acoustic environment in which clear communication between teachers and students is achieved while disturbance from other activities is minimised. For staff work areas and private offices, the requirement includes providing an acoustic environment conducive to the effective performance of office duties, meetings, conversations, interviews and similar functions, with degrees of privacy appropriate to the functions and activities.

For spaces intended to be used to support Learning Support activities, more onerous requirements are specified, reflecting the tendency for increased acoustic sensitivity of Users and activities relating to the Education Services.

15.2. Design Background Noise Level

Limits are provided for background noise levels in accordance with the relevant Australian Standards, ACT Legislation and local guidelines. Where these documents are insufficient to provide sufficient information, additional advice is provided below:

15.2.1 Building services noise limits

The Contractor shall meet the building service noise limits in accordance with the requirements of the current version of AS/NZS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors.

The building services noise criteria shall be achieved at all times when the classrooms are occupied or in use, and when the mechanical services are operating at the performance levels needed to deliver the required indoor climate conditions.

The Contractor shall note that the:

- L_{Aeq} is the A-weighted equivalent continuous sound pressure level;
- levels apply to finished, furnished but unoccupied spaces;
- limits apply to all building services operating normally and simultaneously, including hydraulic services, lighting, ventilation and extraction fans, ceiling fans operating at the design performance and ratings;

15.2.2 External noise ingress

Noise ingress due to sources outside the School shall be limited to comply with the requirements of the current versions of the following Australian Standards:

- Aircraft noise in accordance with AS 2021 Acoustics – *Aircraft noise intrusion – building siting and construction*.
- Road traffic noise in accordance with AS 3671 *Acoustics – Road traffic noise intrusion – building siting and construction* and the *Roads ACT Noise Management Guidelines*.
- Rail noise – In the absence of an ACT guideline covering the subject, rail traffic noise can be assessed in accordance with the NSW document “*Development near rail corridors and busy roads – Interim Guideline*”.
- Industry/commercial noise in accordance with the ACT Environment Protection Regulation (2005).

The Contractor shall note that the:

- the noise limit shall not be exceeded with the windows closed on the basis that teachers shall have the option of opening or closing the windows. However, where noise levels with open windows are expected to exceed the noise limits regularly (e.g. because of fixed or repeating noise sources such as industry, aircraft, or road traffic), the Contractor shall provide sufficient ventilation/ cooling to enable an acceptable internal comfort environment to be achieved with the windows closed.

The Contractor shall implement acoustic treatments that improve the acoustic functionality for sports halls where these are expected to be used for other activities such as assemblies, or student tests and examinations.

15.2.3 Rain noise

Rain noise is to be a consideration for all noise-sensitive areas. This said, the ACT is a dry climate and the occurrence of heavy rain during school hours is minimal. Typically, heavy rain events often occur in combination with high wind, lightning and thunder, which themselves generate significant noise.

Rain noise could be an issue where sandwich panel type roof construction is used. However, considering potential advantages of such systems to thermal insulation values and ease of construction, such systems may be installed, providing detailed assessments of rain noise impacts are made and suitable methods for mitigation are used.

In recognition that heavy rainfall is a very low risk in the ACT, the following target levels are recommended:

Based on a rainfall rate of 15mm/hr per hour, the Contractor shall provide roof constructions (including consideration of rain noise intrusion from roof level sources such as roof lights and clerestory windows) to achieve an internal noise level not more than 50 dBA in all rooms with a low or medium noise tolerance, when referencing Table 13.

15.3. Airborne Sound Insulation between Spaces

15.3.1. Room to room

Airborne sound is to be attenuated between rooms – walls and floors. The sound insulation requirements are based upon the activity noise rating in the source room and the noise tolerance rating in the receiving room. The ratings are detailed for each space in Table 13 and Table 14 below.

Based on this information, the Contractor shall provide the minimum airborne sound insulation in accordance with the Table 14. The airborne sound insulation requirements are provided in terms of the weighted sound reduction index (R_w) values between two spaces. These apply to solid partitions only. Due to the limitations regarding doors and glazing, these will be specified separately.

Table 13 - Sound insulation ratings

Type of room	Activity noise (Source room)	Noise tolerance (Receiving room)
Classrooms, general teaching areas, seminar rooms, tutorial rooms, language laboratories, small group rooms, library/ learning resource centre	Average	Medium
<i>Open plan (See Section 15.4.2) and Learning Community areas</i>		
Teaching areas	Average	Medium
Resource/Breakout areas		
Music classroom		
Small and large practice/group room/dance	Very high	Low
Performance/recital room		
Teaching spaces in Learning Support Units and elsewhere specifically intended for students with special hearing and communication needs, and spaces for special needs students	High	Low
Study room (individual study, withdrawal, remedial work, teacher preparation), Quiet Room	Low	Medium
Quiet study areas / Quiet reflection	Low	Medium
Resource areas	Average	Medium
Science laboratories, STEM, science prep areas	Average	Medium
Materials technology, design studios, adaptable project space, workshop	High	High
Electronics/control, textiles, food technology, graphics, design/resource areas, ICT rooms, art, creative activities	Average	Medium

Type of room	Activity noise (Source room)	Noise tolerance (Receiving room)
Materials technology machines	High	High
Drama studios, performing arts, community hub, assembly halls, multi-purpose halls (including use for drama, physical education, dance, audio/visual presentations, assembly, occasional music)	High	Low
Atria, staff lounge, waiting areas, circulation spaces used for circulation and socialising but not teaching and learning	Average	Medium
Sports halls (if only provided for sport use)	High	Medium
Meeting rooms, Interviewing/counselling rooms, video conference rooms	Low	Low
Dining rooms	High	High
Kitchens, Laundries	High	High
Offices, medical rooms, staff rooms	Low	Medium
Corridors, stairwells, coats and locker areas	Average	High
Changing areas	High	High
Toilets	Average	High

Table 14 - Sound insulation requirements for general spaces

Minimum DnT,w		Activity noise in source room			
Noise Tolerance in Receiving Room		Low	Average	High	Very High
	High	35	40	45	50
	Medium	40	45	50	55
	Low	45	50	55	55

The Contractor shall note that:

Where there are walls containing hydraulic services adjacent to a space that has a low or medium noise tolerance, the wall must be constructed using minimum Rw 55 construction and discontinuous construction, meaning the wall has two separate leaves with no physical connection except at the periphery. Any hydraulic services contained within this wall must be fixed only to the leaf on the side of the wall that is served by the hydraulic services, with no connections at any point, and a minimum of 10 mm clear ance to, the other wall leaf.

15.3.2 Doors and Glazing

The Contractor shall provide constructions between rooms and circulation spaces with the minimum weighted sound reduction performance provided in the table below:

Table 15 - Sound insulation requirements for Doors and Glazing

Type of space	Minimum R_w	
	Glazing	Doorset
All spaces except music rooms	35	30
Music Rooms	45	33
Spaces separated by sliding doors	35	25
Operable walls	45	45
Bounding walls beside and above an operable wall	50	50

Notes:

1. The design of dedicated music areas, especially situations where there are multiple music practice rooms and the like in one area that are used simultaneously, may warrant considering the use of higher acoustic ratings for the doors. Where this is necessary, the use of sound locks is recommended. This could be a central corridor with rooms branching off, or it may be a small sound lock from a “public” space into the music area. A sound lock can often provide an acoustic rating higher than R_w 50 using two R_w 30 doors with a space between and is a very effective way of providing excellent acoustic separation. This needs to be a site-specific consideration for each design.

The Contractor shall note that the:

- R_w is determined by laboratory testing and can be demonstrated by submission of appropriate acoustic test reports for the constructions being used;
- Because of the difficulty meeting acoustic performance criteria, operable walls should only be used where acoustic separation is not a critical aspect of the design. Operable walls should not be used between music spaces unless absolutely necessary for the functionality of the space; and
- because of the difficulty meeting acoustic performance criteria, sliding doors are only to be used in locations where there are compelling function requirements that can only be achieved by sliding doors.

The sound insulation performance for the doorsets, as provided in Table 15 above, applies to all doors except storerooms, service areas and the like, where no specific acoustic performance criteria is necessary.

In all cases, the field performance of the partitions shall be designed so that noise flanking paths (such as wall junctions, mechanical services, ceiling cavities and/or services cavities, electrical services and the like, do not degrade the performance of the partitions significantly.

For all partitions, compliance is considered to have been achieved where the installed level difference (D_w) measured with a microphone at 1m to 1.5m from either side of the partition/door is not more than 5dB lower than the specified R_w performance of the weakest element of the partition (for walls without glazing or doors, this will be the R_w value of the wall. For walls with glazing and/or doors, this will be the performance of the glazing and/or door). For operable walls, the in-situ D_w performance shall be not more than 10dB lower than the R_w rating.

15.4. Room Acoustics

15.4.1. General spaces

The Contractor shall achieve the mid frequency reverberation times in accordance with the requirements of the current version of AS/NZS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors. Where acoustic performance is modelled in the design process, the modelling shall be based on the intended space, finishing materials, and extent of acoustic moderating materials that will be delivered in the finished project.

The Contractor shall note that the rooms shall be free of acoustic defects such as audible flutter echoes, focussing and the like.

Where acoustic pinboards (velcroable boards) are to be used to help with reverberation control, the pinboards (velcroable boards) must have the following minimum acoustic properties:

Thickness	Absorption Coefficients per Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
25 mm	0.1	0.45	0.8	0.9	0.9	0.9
50 mm	0.2	0.75	0.9	0.9	0.9	0.9

All acoustic pinboards must be a minimum of 25 mm thick with the entire thickness comprising acoustically absorptive material. The pinboards shall be suitable for adherence to 'Velcro', considering pins are no longer used in schools. Where it is not possible to install 25mm acoustic board (e.g. on joinery doors) the Contractor is to demonstrate that the acoustic requirements of the spaces is achieved.

15.4.2. Explicit Teaching Spaces

Explicit Teaching spaces and inter-connected Learning spaces are acoustically demanding spaces. There will be different groups acting independently of each other and the noise associated with their separate activities is at risk of causing disturbance to other users of these shared spaces (i.e. the background noise level increases resulting in a decrease in speech intelligibility).

The Contractor shall meet a Speech Transmission Index (STI) of >0.6 for open plan teaching spaces. In addition, the STI between different groups in open plan areas shall not exceed STI of <0.3 (to minimise interference between different activities).

The background noise component in the STI calculation shall include:

- activity noise from adjacent activity areas
- indoor ambient noise due to mechanical services;
- transmitted noise from outside

To assist with this, the sound power levels from the following table shall be used as the basis for modelling the impact of background noise due to adjacent activity areas within open plan learning and teaching spaces.

Table 18 - Sound Power Level (dB re 10⁻¹²W)

Octave Band Frequency Hz	125	250	500	1k	2k	4k	8k
Open plan space – general working (15) students	62	62	62	62	57	52	47
Speech at normal level (per person)	60	66	69	62	57	53	50
Quiet student working (per student)	30	32	32	30	28	26	20

The Contractor shall note that:

- the STI shall be calculated based upon the expected layout and activities (including teaching and studying) and transmitted noise from adjacent spaces
- a computer model shall be created and the STI predicted
- the overall noise level shall be used as the background noise level (see above)
- the STI performance is to be based on speech transmitted between students and teachers and between students

the assumed student head height when seated is 1m for primary school, 1.2m for secondary school and 1.2m for teachers. Assume a student head height when standing of 1.2m for primary school, and 1.65m for secondary schools and for teachers.

15.5. Vibration

The Contractor shall ensure that vibrations from building services plant does not result in excessive noise that exceeds the building services noise limits as set out in the current version of AS/NZS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors. In addition, surface vibration (rms velocity) in occupied areas is not to be perceptible.

Vibration levels in occupied spaces shall not exceed Curve 4 in AS 2670.2.

15.6. Impact Sound Insulation of Floors

Where any building in the School will have multiple floor levels, the Contractor shall design the floors to attenuate noise associated with impact sound from footfall, and from other sources reasonably expected based on the functionality of the space. The maximum weighted standardised impact sound pressure level $L'_{nT,w}$ (in accordance with ISO 717.2, with the value of $T = 0.5$ s) shall not be more than the requirements below.

For floors above:

- teaching spaces, administration and staff areas, the maximum $L'_{nT,w}$ is to be 60 dB; and
- music rooms and classrooms designed for the hearing impaired the maximum $L'_{nT,w}$ is to be 55 dB.

15.7. Noise to External Environment

The Contractor shall meet the requirements of the Environmental Protection Act, the ACT Environment Protection Regulation and the ACT Noise Environment Protection Policy with regard to noise to the environment and any other applicable local planning requirements, including compliance with the Noise Standards applicable for the location where the development is constructed.

Plant that operates at night (e.g. purging fans) shall have sufficient noise attenuation built in to ensure the night-time noise limits are not exceeded.

In addition to this, the noise from mechanical services shall not exceed the following levels on the Site:

- 55 dBL_{Aeq,30mins} - in playing fields or other outdoor areas
- 50 dBL_{Aeq,30mins} - in outdoor teaching areas

Rooms to be used for music performance / rehearsal shall be provided with sufficient ventilation to allow windows to be kept closed for extended periods.

15.8. Design Requirements

The following are offered as general guidance but do not negate the requirement to achieve the acoustic criteria given above.

15.9. Building Services Noise and Vibration

Noise due to mechanical plant and arrangement of components shall comply with the internal and external noise limits.

The Contractor shall locate Plant outside of and away from noise sensitive spaces with appropriate safe access for maintenance.

Care shall be taken to ensure that regenerated noise from bends and take-offs is low enough to ensure that the noise limits are met. This shall include:

- arrangement of duct routes for smooth airflow conditions in ductwork (minimising regenerated noise at bends, take-offs and transitions, etc.)
- use of a self-balancing system (thereby minimising the need for volume control devices)
- controlling velocities in ducts serving the spaces to be adequately low. Seek guidance from ASHRAE and AIRAH publications for suitable duct velocities

Terminal units i.e. grilles and diffusers shall be selected to comply with noise limits (taking into account other building services noise sources).

Duct-mounted attenuators may be required on both the supply and extract systems for noise sensitive spaces. This may include extraction and ventilation fans.

The Contractor shall ensure that mechanical and electrical services do not undermine the sound insulation requirements. The Contractor shall comply with the following:

- acoustic bounding walls shall extend to the roof space if the ceiling construction and lining is not effective as an acoustic boundary
- flexible ductwork shall not pass through full height partitions
- Where hydraulic waste pipes, stormwater pipes and the like pass through a space with a noise tolerance rating of low or medium, the pipework shall be treated as follows:
 - o Lag the pipes with an acoustic pipe wrap that has a minimum mass per unit area of 4.5 kg/m² and contains a foam decoupling layer of minimum 12 mm thickness
 - o Provide minimum 50 mm thick, 20 kg/m³ acoustic insulation in the cavity containing the pipe, extending at least 600 mm past the outer extents of the pipe, or in the case of a bulkhead or riser of lesser dimensions than 600 mm, completely fill the space with insulation
 - o Provide a minimum solid, impervious lining with a mass per unit area not less than 8.5 kg/m², such as 13 mm plasterboard

Note also:

- cross talk attenuators may be required if ductwork systems serve adjacent noise sensitive spaces
- avoid flexible ductwork in areas where high levels of sound insulation are required
- above ceiling plenum may require attenuation if walls are full height
- air transfer grilles in any sound insulating constructions (including doors) shall be avoided or attenuated
- all ductwork / pipework / cable penetrations shall be sealed effectively

- acoustic lagging to pipework located in or above occupied spaces may be needed to meet the building services noise limits
- it is expected that Plant will need to be provided with appropriate anti-vibration mounts to meet vibration limits
- is provided lifts shall not be located on any wall shared with a teaching or office space without incorporating additional acoustic treatment to control noise and vibration
- toilet / plumbing components shall not be fixed to any wall shared with a teaching or office space without incorporating additional acoustic treatment to control noise and vibration
- electrical penetrations (such as GPO's) shall be staggered across wall studs. If back-to-back electrical penetrations are unavoidable, an appropriate acoustically rated backing box shall be used

15.10. External Noise Ingress

The Contractor shall comply with the noise ingress limits in accordance with relevant requirements, including road traffic noise, industrial noise, rail and air traffic noise (where applicable).

For a naturally ventilated building the ventilation system may require acoustic treatment to attenuate external noise. Natural ventilation may not be appropriate in areas where the background noise level is high.

When windows, operable walls and doors are closed they shall seal effectively.

Light weight roofing systems shall be provided with additional acoustic and noise dampening treatments to meet the rain noise limits.

15.10.1 Sound Insulation

Walls and Partitions

Appropriately sized zones to accommodate the space requirements of sound insulating constructions shall be considered during early planning.

Music rooms will be noisy and shall be carefully planned to avoid them being located close to noise-sensitive spaces. Rooms used for brass, percussion or amplified instruments are particularly noisy and shall be designed and constructed to manage acoustic containment.

Placement of toilet and amenity spaces shall be considered to minimise the impact of hydraulic noise transfer to teaching and administration spaces. In locations where teaching and administration spaces are adjacent to walls containing in-wall cisterns or noisy pipework, or noisy appliances are located on the opposite side of the wall, the walls shall be constructed and insulated to prevent noise intrusion to adjacent spaces.

The Contractor shall provide partitions (including glazed and operable partitions) to meet the minimum sound insulation requirements.

All flanking paths need to be considered and appropriate treatments provided to stop noise travelling via these paths and reducing the level of sound insulation provided. This is particularly relevant at junction points.

Flanking noise travelling between spaces via open windows shall be specifically considered where spaces are not mechanically ventilated. Where there is risk of disturbance the windows shall be placed as far apart as practicable.

Consideration shall be given to the difference in the sound insulation ratings based on laboratory tests which are conducted under ideal conditions and the on-site performance which is lower due to constraints on workmanship and noise flanking paths.

To avoid undermining the sound insulation performance of constructions the following shall be observed:

- care with detailing and construction will be required where the partitions meet the façade in order not to undermine the sound insulation
- all building services penetrations shall be appropriately sealed (including those in the ceiling cavity barriers)
- Acoustic rated bounding partitions shall be built 'slab to slab' or 'slab to roof' unless it can be shown that the overall performance can be achieved with a common ceiling or floor void. Additional acoustic measures shall be provided if a suspended timber floor is used in lieu of a concrete slab

Doors

Doors shall meet the required minimum sound insulation performance in accordance with the requirements of Table 14 and 15.

Doors to adjacent spaces shall be placed as far apart as practicable. Doors in rooms opposite each other shall be offset.

The Contractor shall provide doors which can be easily opened by Users of all ages and abilities.

The hardware and door seals on doors shall be appropriate for the heavy usage that doors will be subject to:

- the sealing mechanisms of doors shall allow for the accommodation of building tolerances and of floor level variations, shall work with the selected floor finish and shall be site-adjustable and maintainable;
- lobbied door sets can be used to provide a higher level of sound insulation using doors with a lower acoustic performance;
- air transfer grilles or door undercuts shall not be installed in acoustic doors and doors in acoustic rated walls; and
- if required, the Contractor shall provide a proprietary system for sliding doors to meet the acoustic performance requirements for interconnecting doors and doors to corridors.

15.10.2 Room Acoustics

The Contractor shall design and incorporate sound absorbing treatments so as to avoid all acoustic defects i.e. echo, flutter echo, focussing. If required, the Contractor shall provide acoustic treatment on walls as well as ceilings (e.g., gyms, music spaces, etc.) in order to achieve the specified performance identified in the current recent version of AS/NZS 2107 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

15.11. Others

The Contractor shall locate noisy equipment so that it does not cause nuisance and disturbance to Users and to neighbours. Where possible, the Contractor shall locate the equipment in a separate room. Where this is not possible the Contractor shall use appropriate barriers to reduce the noise in adjacent spaces/areas. Externally mounted noisy equipment shall be positioned remote from openable windows and doors.

15.12. Post Occupancy Evaluation

Post occupancy evaluation may be conducted by the Territory. The post occupancy evaluation may include measurements of:

- Internal noise levels

-
- Internal reverberation times
 - Sound insulation between spaces
 - Sound Transmission Indexes

Where testing is to be conducted, the Territory will organise the testing with a specialist acoustics contractor of their choice. Where post-occupation evaluation testing meets the requirements outlined in this Specification, the cost of the testing will be borne by the Territory. Where testing indicates that the requirements of this Specification have not been met, the cost will be passed on to the Contractor. The Contractor will then be responsible for remediation works and the subsequent testing required to prove compliance with this Specification.

16. Security Technology

16.1. Overview

The Contractor shall provide electronic security systems for intruder detection to the School. Where Non-Mandated Community Facilities are integrated with School buildings, the electronic security systems shall cover all protected spaces in all buildings.

The Territory will separately engage a security monitoring company to provide remote security monitoring services across all ACT schools. The Contractor shall allow to coordinate with the signalling requirements of the incumbent security monitoring company. The installed system shall communicate with the remote monitoring station, providing immediate notification to the station of any security alarms at the School.

16.2. Standards, References and Specifications

Equipment and infrastructure shall comply with the applicable requirements of the documents listed below. The security services design, installation and operation shall comply with all relevant standards, codes and regulations and specifications of the Authorities having jurisdiction over such works, including the following:

- AS 2201:2007 Intruder Alarm Systems Parts 1, 2, 3, 4, & 5
- AS 3548: Electromagnetic interference
- AS 4252: Electromagnetic compatibility
- AS 62040: 2003 Uninterruptable power systems (Parts 1, 2 & 3)
- ACT ETD Security Guidelines (current version)
- ACT ETD Building Guidelines – Security Alarm Installation/Upgrade/ Maintenance standards for ACT Public Schools (current version, and in-so-far as they apply to new systems and on-going maintenance)

16.3. Intruder Alarm System Functional and Performance Requirements

The Contractor shall supply and install an intruder alarm system at the School. The system shall utilise dual technology (passive infrared and microwave) detectors (PIRs). Detectors shall be positioned based on the design for the School, including the number of external entry points and the configuration of internal spaces.

The deployment of PIR motion detection sensors shall monitor high risk points of entry and monitor the main internal circulation routes, to track the point of intrusion and assist in locating intruders. Reed switches shall not be installed on external doors to monitor door status. Detectors shall be installed in the internal side of the School to monitor movement through all external doors. The same principle shall apply to protect external windows. PIRs shall be placed to cover the length of internal corridors and circulation spaces – with detector spacing not to exceed 15m. The coverage of PIRs shall overlap to provide cross coverage.

PIR motion detection sensors shall only be activated when the intruder's mass exceeds 30kg.

The security system shall be capable of being armed and disarmed:

- across the whole School; or
- in discrete zones, allowing isolation of defined areas of the School to provide limited access to those areas when required by authorised Users

The security systems shall be configured to enable non-technical staff to perform all necessary operational parameter changes and interpret alarms and events following minimal training.

The scope of the installation shall include all Transportable Classrooms scheduled for installation on the Site prior to Commercial Acceptance of the relevant School and shall include pre-wiring leads and installation of sealed buried conduits to facilitate extension of the electronic security system to the locations of future long term and peak Transportable Classrooms.

The security system shall be capable of being coded for multiple different PIN's that the School issues to individual staff members to permit identified entry and zoned or general arm or disarm functions.

The intruder alarm system shall include internal sirens distributed through the buildings, which shall initiate a high-volume audible signal when an intrusion is detected. The intruder alarm system shall not include externally mounted sirens that deliver a signal that will cause nuisance to neighbours. The volume of internal sirens shall meet ACT noise regulation compliance requirements.

The system shall include an externally mounted blue strobe light, that is visible from the street at the main point of entry, and which shall be activated when an alarm signal is sent.

Table 18 – Priority Rating for Protected Areas

Rating	Primary School	Secondary School
1 – High Priority	Main entry foyer Administration office Business Manager's office Library entrance and workroom Canteen Staff rooms Learning Communities/ Neighbourhoods Corridor junctions, stairways, points of entry Music room/ instrument storage	Main entry foyer Administration office Business Manager's office Library entrance and workroom Canteen Staff rooms Learning Communities/ GLS Corridor junctions, stairways, points of entry Music room/ instrument storage Art areas Media studio and store Laboratories or storerooms where dangerous chemicals are stored
2 – Medium Priority	School Principal's office Senior personnel offices Audio visual rooms	School Principal's office Senior personnel offices Audio visual rooms Materials technology areas
3 – Low Priority	Gym Gym store	Gym Gym store Food technology

The necessary locations and quantities of remote arming station (RAS)/ keypads shall be based on the School design and the operational requirements of the School. A School may have multiple points of entry and out of hours access may be required by community groups to some areas (e.g. gymnasium or meeting rooms) of the School. RAS/keypads shall be placed at locations to facilitate general or limited access to these spaces and the disarming of the associated protected areas. It is anticipated that more than one RAS/keypads shall be required in each School.

16.4. Protection of Operable Windows

Refer to Section 5.12.

In general, external windows are non-operable however a few shall be operable to provide emergency ventilation in the event of failure of the HVAC Systems.

These windows shall incorporate reed switches, monitored by the Intruder Alarm System.

16.5. Protection of PV Systems

Where photovoltaic (PV) solar panels are installed at School, these panels shall be protected against theft using movement sensors (suitable for exposed outdoor service) installed on the panels and connected to the intruder alarm system.

16.6. Duress Alarm

Duress alarm buttons shall be installed in the following locations:

- interview rooms
- meeting room off entry foyer
- counsellor's room
- at the back-exit door from the General Office
- at the School Principal's meeting space
- the first aid room/ Sick Bay

Each button shall be individually monitored by the security system with the highest alarm priority assigned. When a duress alarm button is pressed, it shall send a silent signal to trigger a remote warning device (e.g. a red strobe light for work spaces and a green light for the first aid room) in the General Office, the Staff Lounge and the Schools Principal's meeting space to alert staff members that a duress incident has happened in the School. The warning lights shall be labelled.

16.7. Access Card / Token Technology

Provision of proximity card access technology is not mandated across all points of access for the School. Door control using proximity card access technology is required for the main entry door to the Gymnasium, to one external door for each Learning Community, to the main entry door to the administration building and to the external door to the Community Multi-purpose Room – to facilitate out-of-hours access by approved users.

The Contractor may choose to include such technology to deliver additional functionality, including (by way of example) provision of card-controlled boom gates to staff car parks, and provision of limited and controlled parent access to staff car park areas to aid and assist students with special needs. The Contractor may choose to include proximity card access technology to more buildings and more points of access as an additional security measure as part of its offered works. Rationalisation of the deployment shall be undertaken with the Territory to determine which access doors are to be provided with access control.

The proximity card access system and installation shall comply with the following requirements:

- the intruder alarm system and the access control system shall operate as two fully separated systems with no integration. The access control system shall not arm, disarm or override the intruder alarm system
- the access control system shall be expandable

- the access control system cards shall be programmable to permit access only to selected doors, and be cancellable from the system control station if cards are lost
- the access control system shall interface with the fire panel to automatically release controlled doors along fire evacuation paths during a fire emergency
- if mains power supply fails, the doors controlled by access cards and electronic strikes shall remain locked. A mushroom cap release button shall be installed at the secure side (inside) of a door. The release unit shall be connected directly in series with the power supply unit of the electronic door lock. When the release unit is activated, it shall release the lock immediately. The status of the release unit shall be monitored by the access control system
- back-up batteries or UPS that comply with the requirements of the relevant Australian Standards shall be provided to sustain security and prevent default release of controlled doors in the event of a failure of mains power
- the Contractor shall provide system software and a proximity card programmer at the School, for use by the School to manage:
 - the access rights and profile of each cardholder
 - the addition of a new access cards
 - the cancellation and deletion of any existing issued cards
- The access control system is to comply with the Shared Services ICT Standards – PART B Physical Security Guidelines (current version) and is provided with this RFT as part of the Principals Documents
- The electronic access card system is to be installed only by approved vendors, as listed in the Physical Security Guidelines
- The vendors/sub-contractors are to liaise with Shared Services ICT for system approval, during design and installation

16.8. Physical Security

The Contractor shall provide the following physical security measures:

- secure locking to external doors and openable windows
- the meeting room off the entry foyer shall have a second exit door (for staff use), leading back into the general office/reception area, that is locked with an electronic strike and controlled by a card reader
- a lockable door or doors with electronic strike that connects the School reception lobby from the internal school circulation network, that can be remotely operated from reception or by card readers either side of the door
- enclosures to protect outdoor equipment such as air-conditioning units and pumps against theft and vandalism
- an internal key safe
- a secure and master keyed keying system for all locks and locking cylinders across the School
- fencing as described in *EDIS: Part C – Master Planning and Architectural Specifications*

16.9. School Lockout and Lockdown Procedures

The Contractor's active security technology and physical security measures shall support the quick implementation – by school staff - of Lockdown and Lockout procedures.

16.9.1 Lockdown

Lockdown is a procedure used when there is an immediate threat to the school occupants. It can be external or internal in origin. It may be caused by human or environmental factors. A full lockdown minimises access to and egress from the school and secures staff and students in rooms. As part of this procedure, everyone shall remain in secure locations until the situation has been declared safe by an authorised person (e.g. School Principal or Emergency Services Officer).

The School design and the security design shall support the following Lockdown operations:

- An internal/ external alarm system is required with the capacity to sound a tone alarm across the whole School to alert the students to move back into the school buildings. The Public Address System may be used to sound the alarm to alert the students provided it has coverage over external areas
- Students, staff and visitors assemble in secure area(s) in the School buildings
- Staff will secure the external perimeter of buildings by closing windows, closing external operable walls, and securing external doors of the area(s). Where doors are controlled by an access control system this system will be activated; and
- Staff will lower blinds to control visibility into the space.

16.9.2 Lockout

A Lockout is a procedure that prevents unauthorised persons from entering the school and is commonly used when the threat is general, or the incident is occurring off the school property. This procedure allows school activities to continue as normal during the outside disruption.

A lockout procedure minimises access into and visibility into secured areas of the school. An audible signal will sound across the school (as for Lockdown, but with a different tone). School staff will secure boundary gates and gates that secure contained courtyards. The security design shall allow the School to be divided into secure areas and facilitate the securing of any such area of the School so that hostile persons are locked out from that area.

16.10. CCTV Monitoring

Closed Circuit TV (CCTV) monitoring is not mandated for the School. The Contractor shall note that permanent recording of CCTV images of minors is not currently permitted in ACT Government schools.

However, the Contractor may consider that CCTV coverage at doors, and coverage of concealed or remote spaces (with observe-only monitoring from an on-site monitoring station) can assist in the operation of the School. If the Contractor proposes to include CCTV as an additional security measure as part of its offered works, the Contractor shall firstly contact the ETD Project Manager and:

- describe the particular need for CCTV and the proposed extent of the installation
- describe the proposed CCTV technology, including event recording functionality
- explain how the system will comply with the ACT Government Code of Practice for CCTV Systems
- obtain the approval of the ETD Project Officer

16.11. BMS Connectivity

The security system shall have an interface to the BMS to indicate a common fault with regards to the hardware or the power supply including any UPS.

17. Vertical Transportation

17.1. General Requirements

If the Contractor's design proposes multiple storeys or split-level floors in any building, the Contractor shall provide vertical transportation to ensure that the School is accessible to all users and compliant with all relevant regulations. If vertical transportation is provided, it shall meet the following requirements:

- the lifts shall be key, or swipe card protected, providing controlled access and use for students with additional needs or an injury, visitors, and members of staff only
- the lifts shall contain alarm communication devices such that school and The Contractor's staff are aware of a trapped person; and communication can be made with a 24-hour help line via a direct link to notify an appropriate party of their location and initiate their release;
- lift capacity and lift car design shall be accessible and appropriate for its intended use

17.2. Compliance with Codes and Standards

To the extent that lifts are provided, they shall satisfy the minimum requirements of the Building Code of Australia, all Australian Standards (including AS 1428.2 and AS 1735.12), and the relevant DDA legislation.

If any design relies on a low-rise wheelchair platform lift to provide an accessible transition between split floor levels (nominal maximum 1200mm difference – for example to a raised stage otherwise accessible only by steps), such platform lifts shall comply with AS 1735.14, the relevant DDA legislation, and the requirements of the NCC, Section E 3.6.

17.3. BMS Connectivity

Where the lift motor room has mechanical ventilation and/or air conditioning, the space temperature shall be monitored by the BMS.

The power supply to the lift motor room shall be monitored by a smart meter connected to the BMS.

The lift controller(s) shall have an interface to the BMS to indicate a common fault with regards to the hardware or the power supply including any UPS.

18. External Elements and Landscape Works

18.1. Student Play Settings

18.1.1 Play Equipment

THIS SECTION IS CURRENTLY UNDER REVIEW. THE CONTRACTOR IS TO ALLOW FOR SPECIALISED PLAY EQUIPMENT FOR THE LTE NUMBERS AS MODIFIED BELOW. NATURE PLAY SPACES ARE INSTEAD ENCOURAGED TOGETHER WITH BROAD AREAS FOR SELF MADE PLAY AREAS AND THE PROVISION OF TWO 12M² SEALED AND LOCKABLE SHEDS FOR OUTSIDE EQUIPMENT STORAGE.

The Contractor shall provide specialised playground play equipment for all schools. Playground equipment shall comply with all relevant standards and codes. Inclusiveness is the key principle in planning and providing external play areas. Each student, teacher, parent and visitor shall be able to access and enjoy multiple play options regardless of their individual circumstances.

While safety is a priority, play spaces shall also be inclusive, challenging and exciting environments. Play equipment and play areas shall offer students opportunities for socialising, for adventurous and creative play, and for encounters with challenging tasks and activities that develop and enhance courage (though risk taking), self-belief, physical strength and dexterity, cognitive development, balance, sensory and motor skills, and similar capabilities.

Play equipment areas shall be accessible by students in wheelchairs. Where soft fall is provided it shall accommodate wheelchair access to each of the elements of the play equipment. Where sleepers are used to create a boundary around play equipment, defined access shall be provided for wheelchairs.

Playground equipment shall conform to the following requirements;

- all equipment shall be securely fixed to footings unless specifically designed to be portable;
- shall comply with AS 4685-2014, and be robust and low maintenance;
- shall be segregated into age specific groupings, in close proximity to the targeted student Learning Neighbourhoods with the design of the facilities and the provision of play equipment tailored to the needs of each age group as follows:
 - Pre-School to Grade 2 – Play spaces with a focus on imaginative and creative play, with a minimum play equipment capacity of **10%** of the LTE numbers for this age group at any one time
 - Grades 3 & 4 – Play spaces with a focus on action-based play, with a minimum play equipment capacity of **5%** of the LTE numbers for this age group at any one time
 - Grades 5 & 6 – Play spaces with increasingly challenging action-based play, with a minimum play equipment capacity of **5%** of the LTE numbers of this age group at any one time
 - Grades 7 to 10 – Play spaces with increasingly challenging action-based play, with a minimum play equipment capacity of **5%** of the LTE numbers of this age group at any one time. For this age group, external equipment provided for sport and fitness shall be arranged to form an exercise circuit along a paved pathway
 - Grades 11 – 12 – involved in social interaction, and in formal and informal sports and fitness activities, either as competitors or spectators. For this age group, external equipment provided for sport and fitness shall be arranged to form an exercise circuit along a paved pathway

- shall be located in close proximity to the Learning Neighbourhoods within the areas designed to be used for recess and lunchtime activity periods;
- shall be placed in locations that facilitate supervision by a limited number of school staff;
- shall limit access to less than 3 metres above grade level;
- shall be at least 2.5 metres away from any fences, balustrades, site boundaries, buildings or other similar objects or site features or changes of level of more than 1.0m;
- there shall be at least 2.5 metres between items of equipment; and
- shading systems shall be provided to cover and offer adequate protection from the sun to all playground equipment. The Contractor shall refer to Shade Areas of this Section for additional details of requirements for shading.

The Contractor shall ensure that the greatest vertical distance between any part of the equipment that is a point of intended body support, and the ground surface or part of the equipment beneath is no greater than:

Table 19 – Maximum free height of fall

Age (years)	Maximum free height of fall
0-3	1000mm (1.0m)
4-6	1500mm (1.5m)
6+	2000mm (2.0m)

The Contractor shall provide an acceptable impact absorbing surface to all fall zone areas greater than 500mm free height of fall at all fixed play equipment. The fall zone is defined as the space in, or around the equipment that can be occupied by a user falling from an elevated part of the equipment. The fall zone distance is the minimum distance from any part of the play equipment to any hard surface and the Contractor shall provide a minimum fall zone of 1900mm, measured from any fall edge.

An impact absorbing surface is not required if falls are prevented by engineering means, such as guardrails, nets and barriers.

18.1.2 Nature Play Spaces

Nature play is any activity that gets children active or thinking actively outdoors, with the end goal of building skills and ability to play without the need for adult control. Nature play spaces should offer unstructured spaces and activities for learning and spontaneous play. To encourage active participation in the natural environment, provide opportunities for self-directed play a natural play space should include a blend of natural areas, environmental features and most significantly plants.

Swings, slides and other traditional fixed play equipment may be included if the natural topography or features of the location provide the opportunity for this to seamless blend with the environment whilst still complying with all relevant standards.

Nature play spaces may contain:

- Areas that simulate natural creek beds with strappy plants, shade trees
- Digging patches formed from with a blend of 50:50 sand and topsoil. Topsoil to be suitable for direct use by students
- Automated time flow taps
- Rocks and boulders

- Informal Sandpits formed from boulders or rough sawn sandstone, sleepers or other natural materials able to be securely covered out of hours
 - Mounds and embankments
 - Tree trunks and stumps safely fixed in place, dressed and with a maximum height of 500mm
 - Simple light weight structures constructed from unmilled logs such as tee pees, lean-tos or cubby houses
 - Mist tunnels constructed from low tech material such as irrigation misters attached to reinforcement rods with a simple hose connection
 - Surface treatments where possible should be created by using organic and gravel mulches or steppingstones
 - Defined edges should be avoided throughout the area except where it abuts natural grass areas
 - Understorey planting with a focus on scent, textures and foliage colours
 - Trees, shrubs, groundcovers and sedges should permeate throughout the space
- Trees should also be used to provide natural cool seasonal shade
- Should include habitats and support fauna such as lizards and birds and butterflies

Nature play spaces should be located away from the active play spaces and be partially screened without compromising surveillance however should provide the illusion of being out of sight.

All elements should comply with standards including but not limited to AS 4685 fixed play equipment, AS 4422 playground surfacing and fire protection.

18.1.3 Sand pits

Sand pits shall be provided in the pre-school and the primary school play areas, sized to accommodate 10 – 15 students in individual or group play activities. Sand pits shall be designed to prevent the sand from being distributed into adjacent areas. They shall be located more than 15m from any building entry and surrounded by raised edges with defined areas for ambulant disabled access. The Contractor shall provide suitable removable covers to prevent contamination, such as animal droppings, including an appropriate daytime storage location in close proximity to the sand pit. Two potable water outlets are to be provided adjacent to each sand pit to support water-based play.

18.1.4 Informal play areas

Informal play areas shall include defined external spaces for small groups of students to congregate and engage in quiet, creative play. There shall be a minimum of one 'informal play space' for each class each with a capacity of 5-10 students. Informal play spaces shall be defined by planting that is low enough to permit passive supervision by staff on yard duty. Where feasible, informal play spaces shall incorporate natural materials. The informal play spaces shall be shaded by built shade or natural shade.

18.1.5 External safe play areas

Associated with areas in the design where Learning Support functions can be accommodated, the building design and Site planning shall deliver some spaces where students can play safely in secure outdoor spaces that are physically remote and visually screened from school boundaries, perimeter gates and local roads. It is preferred that general play areas and secure outdoor spaces are not divided or bounded by overt containment barriers such as fences. Open internal courtyards bounded by school buildings would be one design approach. Consideration shall be given to the placement of windows and functional spaces in the adjoining buildings so that opportunities are maximised for staff to supervise these safe play areas during play times.

External safe play areas should be rich environments that may contain a selection of the following:

- mix of accessible pavements

- natural timber deck/platforms with enclosed sides;
- areas of natural vegetation and tree/s for seasonal shade,
- filtered views;
- synthetic turf with an impact layer; and/or
- small sandpit

18.1.6. Pre-school play area

The Preschool area shall have its own dedicated and securely fenced play area. This area shall include;

- grassed and/or synthetic grass area
- a sand pit
- shade structure(s)
- play equipment with soft fall under surfacing

18.2. Fencing

Fencing (including gates) shall be strong, durable, and fit for purpose including the capacity to prevent climbing (for fences over 1.8m height) and withstand vandalism. The placement and design of fencing shall be integrated with all other external works to eliminate footholds and opportunities to climb fences. The topography of the Site will also influence the provision of fencing, balustrades and railings, which shall be installed to provide protection where the landscape design includes changes of level greater than 800mm. Fencing shall continuously engage with natural or adjusted ground levels, to ensure that there are no spaces below fencing panels that could be used to cross the boundary. Security fencing shall be used in locations around the Site perimeter where there is a greater risk of unauthorised entry, and to protect School assets on site (such as external equipment stores, productive gardens, play equipment, externally mounted equipment, etc.).

The requirements for fencing are detailed below:

- The Contractor shall provide fencing to enclose or define areas of the Site. This fencing will vary in height and construction depending on the adjacency context:
 - An area of the site - which includes the permanent buildings (school and pre-school), relocatable modular buildings, external hardcourts and play equipment, and the internal courtyard – shall be bounded by a powdercoat finish steel palisade type fence, minimum 2100mm height. Panels of this fence may be demounted and relocated later if transportable buildings are installed on the site.
 - The boundary of the oval and/or sports field shall be defined with a low fence (nominal 1.0m) height, that presents a barrier to vehicles accessing the sports field;
 - Where buildings surround a central courtyard, non-climbable powdercoat finish steel palisade fencing (minimum 2100mm height) shall be installed across the open spaces between buildings, in order that the central courtyard can be secured out of hours. Each section of fence shall incorporate wide double gates (lockable) to permit free movement of users during school hours. Boundary fencing each side of the public entrance shall return back to the building line to define the limits of the publicly accessible area. This front fence shall weave continuously around indented functions on site such as car parking;
 - The preschool play area shall be bounded by a powdercoat finish steel pool-type fence (1800mm height and maximum gap between pickets of 100mm) which returns against building edges. Gates in this fence shall be secured with pool-type plunger latches; and

- o All above ground water tanks shall be bounded by a powdercoat finish steel palisade fencing (minimum 2100mm height), provided with a single access gate.
- The School's public point of entrance is usually not fenced. The frontage space shall have landscaped treatment to soften and define the space as the school frontage.
- Lockable gates shall be provided in fences at each point of pedestrian and vehicle entry (except the main school entry). Double gates shall be provided to permit maintenance access across the site.
- If the project scope includes a Community use productive garden area and/or a school productive garden, those areas shall be bounded by a non-climbable fencing (minimum 2.1m height), complete with single leaf pedestrian access gate and double leaf vehicle access gates and provision of an access path from a street frontage to facilitate delivery by truck of soil, mulch and the like.
- Waste bin storage areas shall be fully screened – for security and as a visual barrier. Framed walls to 1800mm height (or to 500mm higher than the height of tallest bin or waste hopper) and sheeted in Colorbond steel cladding, with matching steel framed and sheeted gates, would be the minimum acceptable enclosure.
- Where School sports fields are located within 10m of a boundary or a building or a car park, 6m high chain wire screen fencing (ball barrier) shall be provided.
- Where hardcourts are within 5m of a boundary, 3.6m high chain wire screen fencing is required.
- Where hard courts are located adjacent to other sports areas or play areas, 3.0m height chain mesh fencing shall be provided to the perimeter of the hard-court run-off.
- The boundaries of car parking areas shall be fenced if adjacent to an activity area or accessible to students.
- The school bus bay shall be fenced and gated.

All school fences adjacent to public pathways shall be set back a minimum of 500mm from the pathway. Chain mesh fencing shall not be used as the boundary fence type along street frontages. The public (outside) of the fence structure shall not present footholds, posts or rails that would assist in climbing. A concrete mowing strip shall be provided below or each side of all fencing panels.

18.3. Covered Ways

Covered ways shall provide users with protection from the elements (sun, rain and wind driven rain) when users are moving about the Site. The covered way can be a simple structure that comprises a frame, roof decking and associated guttering but the structure shall be stable, robust and durable - suited to external and exposed locations. The roof areas shall be drained to gutters and downpipes connected to the site stormwater drainage system. Columns and posts present an impact risk, and the covered way design shall minimise the number of structural columns.

Artificial lighting shall be provided along the length of each covered way to provide safe travel conditions at night and in low daylight conditions. The covered way design shall not facilitate unauthorised access to the roof areas of buildings.

18.4. Bicycle/ scooter shelters

The Contractor shall provide covered, paved, secure shelters bicycles in accordance with the following requirements:

- bicycle and scooter parking shall be easily accessible and designed to minimise conflict with flows of pedestrians and vehicles;

- perimeter fencing shall be 2.4m height chain wire or similar with locking gates; permitting passive supervision;
- bicycle racks shall be securely fixed to the floor or wall and shall be non-removable;
- bicycle racks shall be the correct height and width to support the bicycle in two places;
- in the case of rails, the frame and at least one wheel shall be able to be locked with a U-shaped lock;
- for staff bike parking, the bike racks shall fit standard size adult bicycles, and shall be located in a storage facility separated from any student bike shelter (and with access control at the gate);
- bicycle storage shall be provided to suit the age and height of the intended users across all Facilities;
- the location of the bicycle shelters shall allow users to ride to within 30m of the bike shelter on a 1.8m width paved pathway;
- bicycle shelters shall be visible from the School, permitting passive supervision;
- lighting shall provide good visibility within the bicycle/ scooter shelter;
- gates shall permit easy unobstructed passage for bicycles; and
- signage shall indicate procedures for locking bicycles and doors or gates.

The Contractor shall provide bicycle/ scooter parking as follows:

- P-6 schools: a weather protected, lockable and secure sheltered space to accommodate not less than 2 staff bike spaces per 200 students and 1 student bike space per 10 students (based on forecast peak enrolment) or satisfy the requirements in the Development Approval Code (whichever is the greater) and shall include a fixed commercial standard manual stainless steel bike pump, suitable for each valve type.
- P-10 schools: a weather protected, lockable and secure sheltered space to accommodate not less than 2 staff bike spaces per 200 students and 1 student bike space per 5 students (based on forecast peak enrolment) or satisfy the requirements in the Development Approval Code (whichever is the greater) and shall include a fixed commercial standard manual stainless steel bike pump, suitable for each valve type.

18.5. School Store

A secure store facility is required to store the school's outdoor equipment (including hoses, sprinklers, mowers, trimmers, leaf blowers, BBQ, etc.). Direct external access via a lockable roller shutter is required. The store shall have a concrete slab floor, internal lighting and power (double weatherproof GPO) and external security lighting, and a suitable cabinet for storage of flammable liquids and chemicals).

18.6. Waste Compound

A screened and contained waste disposal area shall be provided at the Site that provides space for storage of waste hoppers or bins and for the collection of school waste. Screen fencing shall be used to contain the area. The waste disposal facility pavement shall be bounded by concrete kerbs. A hose cock and drainage sump shall be provided to facilitate wash down of the area.

If the waste collection process involves the transfer of waste from wheelie bins into larger waste hoppers, the Territory will provide a powered bin lifter as part of the Territory supplied equipment. An external power outlet shall be provided for the mechanical wheelie bin lifter.

The sizing and design of the waste disposal facility depends on the contractual arrangements applicable at the time when this specification is used. The Territory Government is considering letting a whole-of-government

waste management contract. If that contract is in place, the Contractor shall consult with the appointed waste management contractor to ascertain and design for its requirements for mechanical wheelie bin lifter, waste storage, waste sorting (with space for separation and storage of paper/cardboard, mixed recyclables and compostable organics) and truck access. If waste management forms part of the Contractor's operation phase services, the waste disposal facility shall be sized to accommodate the bin lifter, hoppers or bins for waste and sorted recyclable materials which can be collected and stored prior to collection, based on the Contractor's proposed method of waste management and waste collection.

18.7. External Furniture and Fittings

18.7.1 Seating

The Contractor shall provide both formal and informal outdoor seating.

The Contractor shall provide formal outdoor seating at a minimum of 100mm length per enrolled student (and an overall school minimum of 20m aggregate length of seating for P-6 schools and 30m aggregate length of seating for P-10 schools). Seating configurations shall take into account prospect/vista, shade, age groups, and the benefit of seating arrangements in terms of social development and interaction.

Informal seating or perching spaces for staff and students can be created on the edge of low decks, on sleeper style timbers and on low retaining walls. Manufactured and constructed seating shall be designed to shed water and return to a reasonably dry state quickly after the cessation of rain. At least 50% of seating shall be located in areas shaded from summer sun – with shade provided by shade structures in the short term and a combination of shade structures and shade trees in the long term.

Small group seating areas shall be considered at primary schools for storytelling, outside eating and quiet activities. These will be pleasant areas with winter sun and summer shade and ideally will be separated from busy parts of the play area. A diameter of about 2.5m is suitable for a small group of young students.

Seating shall be appropriately scaled to the student cohort, be robust and durable and be comfortable. The Territory notes that aluminium seating has not been strong enough to provide long term service at both primary and secondary schools.

18.7.2 Litter bins

The Contractor's design for waste management on site, shall support the ACT Waste Management Strategy 2011 – 2025 (refer to Technical Specification Section 8.8 and 8.8.1).

The Contractor shall provide outdoor recycling stations for waste (permitting sorting to mixed recycling, landfill and organics bins) distributed across the School.

The Contractor can elect to manage litter collection using fixed bins (one for every 30 students) as a designed item of landscape furniture or using manufactured mobile "wheelie-bins" colour coded for waste separation. In either case, the Landscape design shall identify distribution and locations of bins, with particular attention to the provision of bins at locations that are sources of waste.

18.7.3 Drinking fountains

The Contractor shall provide the identified number of drinking fountains distributed around the School and conveniently located internally and externally with respect to learning communities as well as external sports and play activity areas. The installation of drinking fountains shall be avoided within 50m of external playing areas having sand pits.

The minimum provision of drinking fountains is:

- 12 drinking fountains for a primary school (at 700mm height)
- 24 drinking fountains for a secondary school (at 900mm height)

The design of drinking fountains shall be appropriate for varying student age levels and access by users with disabilities.

Drinking fountains shall be proprietary free-standing units made of durable and robust materials that can be wall mounted or pedestal mounted with an isolation valve and automatic shut-off function appropriate for Canberra climatic conditions. Installation of these units shall not restrict movement or create WHS and security risks such as climbing points for roof access.

Every drinking fountain shall include a water bottle filler spout (in accordance with the ACT Healthy Weight Action Plan). 50% of the drinking fountains will require branding in line with the ACT Healthy Weight Action Plan. A minimum of 25 % shall be height accessible for disabled students.

Drinking fountains shall have an impervious non-slip floor finish around the fixture and an impervious wall lining where wall mounted as well as comply with the requirements specified in the Hydraulics section of this Technical Specification.

18.7.4 Flagpoles

The Contractor shall provide three flagpoles at the School, each 8.0m height above ground. The flagpoles shall be installed in a straight line at a suitable location near the front of the Site. Each flagpole shall include a lockable stainless-steel wire halyard and all other attachments needed to raise and lower a flag.

An all-weather pavement shall be provided to the base of the flagpoles.

18.7.5 Letterbox

The Contractor shall provide a lockable, commercial quality letterbox, located adjacent to the footpath on the school's main entry path. The letterbox shall be:

- durable metal construction, corrosion resistant, weatherproof and resistant to vandalism;
- sized to receive A4 sized envelopes flat (not folded); and
- able to hold the quantities of mail that can gather when the school is closed over holidays.

18.8. Shade Areas

18.8.1 Built shade

The Contractor shall provide a minimum of 400m² of built shade for the School (in addition to the built shade specifically provided over one external hardcourt) that shall:

- be located with due cognisance to existing services such as drainage, power lines, gas and water;
- withstand a variety of weather conditions, including snow, hail, rain and high winds without damage;
- have a UPF of 50 or higher;
- have a minimum clearance of 3m in height above the ground, or above the highest accessible point beneath the shade structure;
- not impede the vision of supervisors;

- include structural supports that are engineered to be stable, durable and capable of resisting wind loads. Structural supports shall be clearly visible, with rounded edges / and or padding and placed to avoid students colliding with them;
- avoid cables and guy ropes where possible, however if required, these shall be located in garden areas and provide marking and padded protection;
- include vertical supports that are not scalable by students and that do not make fences scalable;
- reduce indirect UV radiation by:
 - avoiding surfaces that are highly reflective. The Contractor shall design soft and / or rough surfaces such as brick pavers and grass, to reflect less UV radiation;
 - ensuring shade structures are adequate in size. UV radiation levels are greater near the edge of the shaded areas than at the centre;
 - using barriers on the sides of shade structures as well as overhead. Vertical screening such as trellises with plants or louvres can reduce indirect UV radiation while still allowing breezes to flow through;
 - extending overhead barriers past the actual area to be shaded. The overhang shall be at least 1m beyond the area to be shaded; and
 - using soft landscaping near a shade structure to help absorb scattered UV radiation.
- have extensive overhead or side cover, and be located away from highly reflective surfaces;
- be an inviting space so that students will want to use it;
- be provided externally to cover the play equipment area for all schools;
- take account of the daily / seasonal movements of the sun, and;
- be complimented by trees that provide seasonal cool shade to the structure.

The effectiveness of built shade in meeting these requirements shall be demonstrated in the design phase by computer animated seasonal shade studies during the design phase.

18.8.2 Natural shade and trees

Where possible, the Contractor shall retain and preserve all existing, suitable shade trees on Site to contribute to the provision of natural shade. Additional tree planting shall be undertaken to provide character and definition and increase the levels of natural shade and shelter from prevailing winds in external areas.

Natural shade from trees shall be a major element of shade provision. The Contractor shall:

- where possible, provide natural shade for the external areas except sports playing fields. Natural shade shall be provided around high use areas, passive and static play areas, where seating is provided and along circulation paths (except where built shade (extended eaves, covered ways, etc.) is provided. The design of shaded space shall take into account the direction of the sun and the time of day that the external space will be used;
- provide deciduous tree species as shade trees (unless otherwise approved);
- provide trees on the perimeter of the Site to provide the maximum protection from prevailing seasonal winds, and contribute to the biodiversity of the site,
- place trees so as to not provide a climbing point to get over the boundary fence, including considering their projected growth; and;

- (during the design stage) identify what temporary shade will be provided by the Contractor in the years until the natural shade trees have become established.

18.9. Soft Landscaping

The Contractor shall provide soft landscaping for the School that complies with the current version of the TCCS Standard Specification for Urban Infrastructure Works (Section 9 – Landscape), and that meets the following general requirements:

- supports biodiversity and utilises multiple species for seasonal resilience and variety;
- suited to the seasonal conditions of the ACT micro-climate;
- all grass mixes for turf areas used by the Contractor shall be drought tolerant, maintain winter colour, minimise the use of any fertilizers, be shade tolerant, reduce mowing requirements, be suitable for formal and frequent sporting activities on designated ovals, and avoid the inadvertent inclusion of any flowering species (such as a clover) to minimise the attraction of bees;
- surfaces need to be drained with falls across the external surface and adequate subsurface drainage;
- garden beds shall be constructed so that soil and mulch is prevented from spreading to adjacent pavements or turfed areas; and
- appropriate surfacing for high traffic areas shall be provided that will be durable and free from trip hazards.

Landscaping treatment (in various forms as specified in this section) shall be provided for the whole of the Site (excluding areas covered by buildings, pedestrian pavements, roadways, car parking and the like). The Contractor is referred to the Schedule of Project Specific Requirements, issued as part of this RFT, which identifies the total area of the Site.

18.9.1 New tree selection and planting

Within the school site native and or endemic species shall be used in combination with deciduous trees (in locations where reduced shading in winter is of benefit). Native trees are to be restricted to the peripheral low use areas of the site. New trees shall be positioned to provide functional outcomes such as shade and shelter as well as spatial benefits without compromising any built structures.

Tree species shall be selected to be appropriate to the location, scale and functionality of the space, and shall:

- establish quickly and have a high long-term survival rate;
- have broad canopies and dense foliage;
- avoid species known to drop branches;
- provide sufficient clearance beneath the canopy to allow access;
- suit the local area;
- not have spiky branches, fruit or seed pods;
- not release high-allergy pollens or seeds; and
- not attract bees or wasps.

Trees shall be appropriately sized at planting with larger specimens selected for feature areas and shade or smaller sizes selected for lower profile areas:

- New feature trees and shade trees shall be provided at a minimum rate of one tree per 10 students (LTE), and be a minimum size of 40L pot size and 2000mm high at planting, installed with stakes and metal tree guards;
- For shelterbelt tree planting, mass planting of tubestock shall be at a minimum density of four plants per m². An active maintenance regime shall provide for progressive thinning to establish a tall effective shelterbelt which allows eye level views through the planting and prevents 'blind spots';
- Where located adjacent to buildings, pavements or services, plant trees in combination with tree root barriers and gutter guards to minimise impact on adjacent structure, infrastructure and finishes, and to minimise ongoing maintenance; and
- Tree locations shall not create opportunities for access to roofs or facilitate climbing over boundary and security fences.

18.9.2 Turfed areas

All areas of the Site not required for other purposes shall be developed as general grassed areas either as synthetic turf, natural grass or planted garden beds. "Dryland Grass" shall not be used. Natural grass shall not be used unless the slope permits safe maintenance (mowing). Where slopes are greater than 1 in 4, the Contractor shall consider alternative treatments such as garden beds and/or stabilization treatments.

Trees are to be planted through these areas to provide natural shade as identified in *EDIS: Part C – Master Planning and Architectural Specifications*.

Synthetic turf is considered to be appropriate for high wear areas subject to its quality, materials and durability to meet the performance requirements of the Output Specification. Small areas of synthetic turf shall be co-located with natural or built shade and be laid over an impact layer.

18.9.3 Irrigation of turf areas

Appropriate sub-surface water reticulation (e.g. driplines) shall be provided to enable turf areas to be established and maintained through all seasons.

Where available, irrigation water shall be sourced from mains-supplied non-potable water on a separate water reticulation system from end-uses that require potable water only. At Sites where mains non-potable water is not available, irrigation water shall be from the potable water supply, unless the Contractor has practical alternative strategies for water salvage and reclamation from roofs and impermeable pavements or other sustainable sources, noting that these water sources are primarily provided to replace the use of potable water in toilet flushing.

An ongoing irrigation management plan shall be implemented to prevent "over irrigation".

18.9.4 Water restrictions

The Contractor shall design the turf grass and planted areas to take into account limitations on the availability of mains water under the prevailing and foreseeable future seasonal water restrictions operating in the location of the School (as may be determined by the service provider or the Territory Government).

18.9.5 Sports playing fields

The Contractor is referred to the Schedule of Project Specific Requirements issued as part of this RFT. That schedule will identify whether the project scope includes the development of sports playing fields on the Site, or whether the School will make use of adjoining community sports playing fields.

Where sports playing fields are to be developed on the Site:

- They shall be developed in accordance with the TCCS Design Standards for Urban Infrastructure, Section 24 – Sportsground Design;
- The Contractor shall, where possible, utilise improved topsoil stripped from the Site due to building works to create flat playing areas.
- All playing fields to be formed from loam-based soils
- All playing surfaces shall be turfed (natural or synthetic), drained with falls across the playing surface and have adequate sub-surface drainage – with a subgrade that maintains water infiltration.
- The sports playing fields area shall be able to accommodate the following sports fields:
 - For P-6 schools, an oval (of minimum size 110m x 90m (7,775m²)), and a rectangular playing field of 68m x 122m overlaid on the same sports field area as the oval, and with safe run-off area in each case;
 - For P-10 schools, an oval (of minimum size 165m x 135m (17,496m²)), and two rectangular playing fields of 68m x 122m arranged side by side overlaid on the same sports field area as the oval, and with safe run-off area in each case;
- Sports playing fields shall be orientated and marked in a north / south orientation. Where sports fields are configured for cricket, a synthetic turf wicket shall be installed.

18.9.6. Synthetic turf / outdoor synthetic carpet

Synthetic turf and outdoor carpets can provide a durable alternative in high-wear areas and as an alternative to natural turfed sports playing fields. The Contractor may consider providing synthetic turf or outdoor carpets in small spaces and areas subject to high levels of pedestrian movement. Such spaces shall be suitable for small groups to sit when grass is difficult to establish and maintain. Synthetic turf shall be fit for purpose and durable. Short pile synthetic turf shall be used in high wear areas, long pile synthetic turf shall be used in smaller seating areas, and suitable pile lengths for sporting activities shall be provided when used on sports playing fields. Synthetic turf shall have a minimum 19mm pile length, a minimum 1000g/m² pile weight and be sand filled and well drained. All synthetic turfed areas and outdoor carpets are to have a minimum impact underlay of 12mm thick. Refer to TCCS Standards for outdoor play equipment.

If the Contractor proposes synthetic turf, the product shall be selected to deliver durable long-term performance, including:

- resistance to delamination from the underlying foundation material;
- tight weave of the “leaf” fibre to the substrate fabric – resistant to un-weaving during normal use;
- resistance to permanent deformation of the fibre; and
- with a fibre that reduces skin abrasion (associated with falls).

18.9.7. Mass planting beds

The planting scheme shall be selected from low maintenance, drought tolerant, hardy evergreen and flowering native and exotic perennial groundcovers, low bushes, plants and shrubs, able to thrive in the given exposure condition, not affected by dry and windy conditions or extremes of temperature. As a minimum, mass planting beds shall be coordinated with building walls, changes of level, steep slopes and other pedestrian impediments. Mass planting can also help define the site boundaries, outdoor learning areas, informal gathering areas and external circulation routes. The Contractor shall provide garden beds in accordance to the following requirements:

- for a P-6 site, a minimum of 1500m² of “ground level” mulched garden beds shall be provided to match existing grades and site contours;
- for a P-10 site, a minimum of minimum of 3500m² of “ground level” mulched garden beds shall be provided to match existing grades and site contours;
- mass planting beds shall be located away from areas likely to be heavy trafficked routes;
- a varied selection of low-water or drought tolerant plant species shall be provided at a minimum density of four plants per m², however, the use of dryland grasses is to be avoided;
- composts and mulches shall be used in accordance with recognised standards;
- if fixed irrigation is provided, it shall be by sub-soil systems (e.g. drip lines); and
- poisonous plants (flower, seed or leaf) or plants that are known allergens shall not be used.

Planting shall also be integrated with civil engineering and the site surface water management. Planting selections shall be aligned for specific locations, such as swale basins or steep slopes, to assist in preventing erosion and scouring, and to improve water infiltration and irrigation of landscaped areas.

18.9.8. Sensory gardens

Refer also to the *EDIS: Part B – Functional Brief*.

Where identified as a requirement in the Schedule of Project Specific Requirements, a fully accessible sensory garden (or gardens) shall be developed. The sensory garden shall be available for use by all students to provide experiences that stimulate the senses, in a location that is sheltered and removed from the noise and activity of the larger school grounds. The sensory garden shall be placed within a defined and safe space (such as a courtyard) proximate to the spaces suited to Learning Support functions. Where the sensory garden is not bounded by building walls, the boundary shall provide a degree of screening from adjacent external areas. The sensory garden shall be away from areas of high activity, and free of extraneous noise and distractions such as sports courts, canteens, outdoor performance stages and the like.

Sensory gardens shall incorporate planting, shade, boundary screening, circulation routes and other elements to give students the opportunity to interact and engage with the planting and setting by:

- seeing, touching, and smelling the planting;
- providing edible, native and exotic plants;
- listening to wind, water, birds, and insects; and
- watching the passage of sunlight over planting and through leaf canopies.

The sensory garden shall include winding paths, places to sit (both shaded and not shaded), and places for quiet play. Planting shall include scented herbs, flowering species, and native grasses that attract native birds.

18.9.9. Productive gardens

A productive garden shall be provided at the School. The productive garden shall be fully accessible and located with access to sunlight, power and potable water. The garden shall incorporate:

- a combination of in ground and raised garden beds, such as wicking beds, should be provided with topsoil suitable for growing vegetables of a variety of types;
- areas sized for planting several fruit trees;
- a hand-wash trough, and hose points;

- a sheltered potting bench/ demonstration bench with space for 25 students to gather and observe the demonstration
- enclosed and secure storage for tools materials fertilisers, chemicals, etc.
- recycled water supply;
- storage for soil and bulk materials;
- provision of vehicular access for truck delivery of bulky and heavy materials;
- reticulated timer operated watering system to garden beds;
- a small animal/ chicken enclosure (shed and fully enclosed run area); and
- space/ containing structure for composting waste.

The productive garden shall be bounded by a perimeter fence that will deter unauthorised access.

Where the Territory agrees that the School site layout does not permit a single enclosed productive garden, the productive garden infrastructure listed above can be fragmented and distributed around the perimeter of Learning Community buildings, with raised planter beds and a small rainwater tank provided close to every second outdoor learning area, fruit trees integrated with planting beds, and the garden store located near to the Learning Communities.

18.9.10. Community gardens

The Territory Government commissioned a study into the demand for Community Gardens. The “Study of the Demand for Community Gardens and their Benefits for the ACT Community” recommended that *“School sites for community gardens have significant potential to maximise the benefits of these spaces for individuals and the community”*.

For new schools located in or near to existing or planned medium density neighbourhoods, community gardens shall be considered. The community garden shall provide a space on the Site for the local community to plant and maintain vegetables and fruits. The community garden shall incorporate:

- a combination of in ground and raised garden beds provided with topsoil suitable for growing vegetables of a variety of types;
- a sub-metered water supply, with a handwash trough and water taps;
- a potting bench;
- enclosed and secure storage for tools, materials; fertilisers, chemicals, etc.:
- power supply (inside secure store) with power outlets;
- storage for soil and bulk materials;
- provision of vehicular access for truck delivery of bulky and heavy materials;
- security lighting;
- shaded hard stand area; and
- space/ containing structure for composting waste.

The community garden (where provided) shall be co-located with the school’s productive garden. The community garden space shall be provided with a unisex toilet. The community garden shall be adjacent to a street boundary and fenced with a 2100mm high chain wire fence so that it is separate from the school and able to be accessed independently. Paths of access to the community garden shall not rely on unsupervised travel across School grounds. It is preferred that the community garden is not located on the school’s main

street frontage. If site constraints mean this is the best location, a landscaped screening buffer shall be provided between the garden areas and the street edge.

18.9.11 Landscaping in Bushfire Prone Areas

Site vegetation can be designed and managed in ways that help resist the risks and damaging impacts of bushfires. When the site is in a bush-fire-prone area, the Contractor shall consider the following in the development of its site planning and landscape design:

- using species that will reduce fire intensity;
- designs to reduce wind speed;
- designs to deflect and filter embers;
- providing shelter from radiant heat;
- avoiding plants and trees that are highly combustible (due to volatile oils) or produce fine fuel which is easily ignited;
- creating horizontal and vertical fuel breaks; and
- using productive gardens as a buffer to buildings.

18.10. Hard Landscaping

18.10.1 Central outdoor space

A central outdoor space shall be provided that will act as the 'heart' of the school. It shall be a large open space with smaller scaled edge spaces, which can be designed as Outdoor Learning Areas. It shall be well located to be close to the classrooms and main entry. It shall provide a sheltered space with protection from the sun and wind using a combination of natural shade, windbreaks formed by planting areas and screens or other built elements. The central outdoor space shall:

- be appropriately scaled to be large enough to accommodate an outdoor assembly of the entire school at Peak Student Enrolment numbers;
- comprise of hard-wearing surfaces with low glare and areas of contrasting colour or texture;
- provide enough external seating for the students (see Section 6.1.12);
- be planned to prevent wear and tear on planting to allow plants to thrive; and
- include a combination of built shade and natural shade with trunks or posts positioned to minimise disruption of the open space and circulation paths.

18.10.2 Outdoor learning environments

The Functional Brief describes the functional requirements of outdoor learning environments, and their direct visual and physical relationship and accessible proximity to internal learning environments.

Outdoor learning environments shall be integrated into the external landscaped area as well as being an integrated component of the total learning environment. Outdoor learning environments shall not be placed in locations where the use of the space will be compromised by distractions - traffic noise and traffic movements, equipment noise, play areas, pedestrian circulation routes, and the like. Soft landscaping and building structures shall be used to enhance the seasonal utility of these spaces, by providing shelter from prevailing winds, summer sun, and rain. Surfacing materials shall be robust but offer areas of contrasting 'softer' feeling but durable materials such as paving, timber decking or synthetic turf. Areas of soft planting

shall be included with irrigation to define the area and shall be positioned appropriately and protected to enable the plants to thrive.

The landscape design and materials should be clearly identifiable (for a young student) what areas are acceptable for student traffic and what areas are irrigated garden beds that students should keep off.

18.10.3. Hardcourts

The Contractor shall provide hard courts and paved areas in accordance with the needs of the School as follows:

- P-6 schools: One double hard court (2 courts side by side, not end to end) shall be provided as well as level paved play areas at least equivalent to the size of a single hard court;
- P-10 schools: Three hard courts shall be provided in appropriate locations (divided and zoned to provide two courts for primary students and one court for 7-10 students) as well as a level paved play area at least equivalent to the size of a single hard court;

The Contractor shall provide hard courts and paved areas in accordance with the following requirements:

- the hard courts shall be designed, and line marked (2 contrasting colours) in accordance with competition guidelines for basketball and netball;
- the hard courts shall be orientated and marked in a north / south orientation and arranged in pairs side by side and not end to end;
- permanent fixtures (goal posts, goal rings, nets, backboards, etc.) shall be provided to support basketball and netball;
- the hard courts will act as a recreation area at recess and lunch times and shall be easily accessible from the Learning Community buildings and readily supervised by staff;
- the hard courts shall be sited in close proximity to the physical education hall and outdoor grassed playing area;
- the paved area can be used for assembly purposes if it is conveniently located and where the proportions of the assembly space are suitable for the activity (ideally square or 1:2 proportion rather than elongated); and
- for one hardcourt at the school, a shade structure (as specified in the Technical Specification) covering the full court area shall be provided, with a minimum of 4.5m height of the canopy, and with structural supports placed clear of the hardcourt and the perimeter run-off space. Structural supports shall not be placed in the shared run-off space between two adjacent hardcourts.

All hard-court areas shall incorporate a minimum 3.7m width obstruction free zone outside of the netball court perimeter.

18.10.4. Paved play areas

Additional line marking for handball courts shall be provided on the general paved areas.

19. Commissioning, Handover and Post Completion

19.1.1 Pre-Commissioning Programme

At least 12-weeks prior to the commencement of any commissioning activities, the contractor shall submit to the PAP, a comprehensive set of site-specific (not generic) inspection and testing plans (ITPs) that cover individual trades, for review by the ICA (Independent Commissioning Agent). The ITPs shall include a schedule of any integrated system tests (ISTs). A commissioning programme shall be submitted to cover the ITPs across all trades and the programme shall be updated periodically to reflect any changes including comments from the ICA.

19.1.2 Commissioning

The Contractor shall carry out tests ("Acceptance Tests") as necessary and in accordance with the Inspection and Testing Plans (ITP)s previously submitted and reviewed by the Independent Commissioning Agent (ICA) to demonstrate the full capability of all aspects of the School to meet the Output Specification (as defined in the Services Specification) and to demonstrate that the Contractor is suitably resourced to deliver the complete range of services from the commencement of Practical Completion.

The Contractor shall ensure the satisfactory operation of the School including building services and FF&E prior to Completion by demonstrating that all aspects of the building services and FF&E are fully operational, including but not limited to:

1. The School is weatherproof and tested for air leakage (permeability), where required under the NCC;
2. Safe access is available to all areas including access to plant and equipment;
3. All equipment is secure (including seismic restraints), labelled and installed with means of isolation for electricity and hydraulic connections;
4. testing and certification of the electrical systems including the requirements in the *Wiring Rules* and any specific requirements of the ACT Regulatory Authority, and ensuring that all circuit protective devices are selected, installed and adjusted (coordinated).;
5. testing and certification of gas systems (natural and LPG) in accordance with AS/NZS 5601 and any specific requirements of the ACT Regulatory Authority;
6. testing and certification of all emergency services including fire protection, emergency lighting, lifts and mechanical smoke control or pressurisation systems in accordance with relevant standards and any specific requirements of the ACT Fire & Rescue Service and other Regulatory Authorities;
7. testing and certification of EWIS, intercom system including duress, automatic emergency messaging and audible alarms;
8. testing and certification of access control, intruder detection and alarm detection systems;
9. testing and commissioning of the BMS and controls system including all safety aspects, interlocks, field devices including control actuators, dampers, valves, energy and water meters including monitoring systems, temperature, humidity, pressure and CO₂ sensors, and any other metering and monitoring devices including any low level or high-level interfaces (HLIs) to associated systems;
10. demonstration of remote access to the BMS, and through interrogation of the BMS, the proving over a two-week period that full functionality is being maintained of all control parameters, energy and water monitoring systems, trending and alarms;
11. calibration and testing certificates for all electricity, gas and water meters with regards to reading accuracy at the BMS in accordance with the NABERS Guidelines for Validation of Non-Utility Meters.

-
12. demonstration of lighting control systems, including motion sensors, daylight dimmers, zoning, pre-programmed modes etc. are functioning in accordance with the design intent;
 13. provision of water and air balancing reports that demonstrate that the installed HVAC systems at the School is operating in compliance with design specifications;
 14. testing and certification of cold water, domestic hot water and re-cycled water systems, flushing of pipelines and sterilisation of water services and testing of hot water services, tempered water systems and thermostatic mixing valves, and temperature monitoring where flow and return systems are used;
 15. commissioning, testing and correct operation of all ICT systems for which the Contractor is responsible;
 16. air or water pressure testing of underground stormwater and sewer pipes in accordance with standards and industry best practice. Closed circuit television (CCTV) inspections and reporting on all drainage structures and pipes greater than 225mm in diameter. Inspections shall verify the works are within the specified tolerances, are without visual signs of structural failure, and that there is no obstruction to the flow of water;
 17. demonstrating that external pavements and landscaped areas freely drain to pits and drains without local ponding;
 18. testing all locks and hardware and providing multiple sets of keys for all lockable doors, padlocks, window locks, joinery locks, roller shutter door locks and the like with each key having a plastic tag labelled appropriately (where electronic access pass systems are installed) testing the operation of access pass proximity readers and the functional operation of doors, gates, etc. that are controlled by electronic access pass cards or fobs;
 19. ensuring all items of plant, FF&E and Appliances are fully operational in accordance with manufacturer's requirements and in accordance with the requirements of the NCC of Australia and relevant Australian Standards;
 20. certificate from a registered pest exterminator that the School is free from pests and vermin; and
- acoustic testing and report by a professional acoustics engineer to demonstrate that the acoustic criteria specified in this document are met in the completed School. ...

19.1.3 Handover Documentation

The Contractor shall hand over to the PAP:

- copies of all completed inspection check sheets, test sheets, reports, commissioning and calibration reports;
- a complete set of the as-built drawings and plans in respect of the Works;
- complete sets of all operations and maintenance manuals;
- a complete set of access keys and access codes for the Works;
- assignments, licences and consents in respect of Intellectual Property Rights and moral rights and licences in respect of Intellectual Property Rights required to satisfy the Contractor's obligations under the Deed; and
- all warranties obtained in favour of the Principal.

19.2. Post Completion Monitoring and Fine Tuning

The Contractor, in conjunction with the Independent Commissioning Agent shall undertake a minimum of three building turning sessions within the first 12 months from Completion to verify and demonstrate that the requirements of the output specifications are being met.

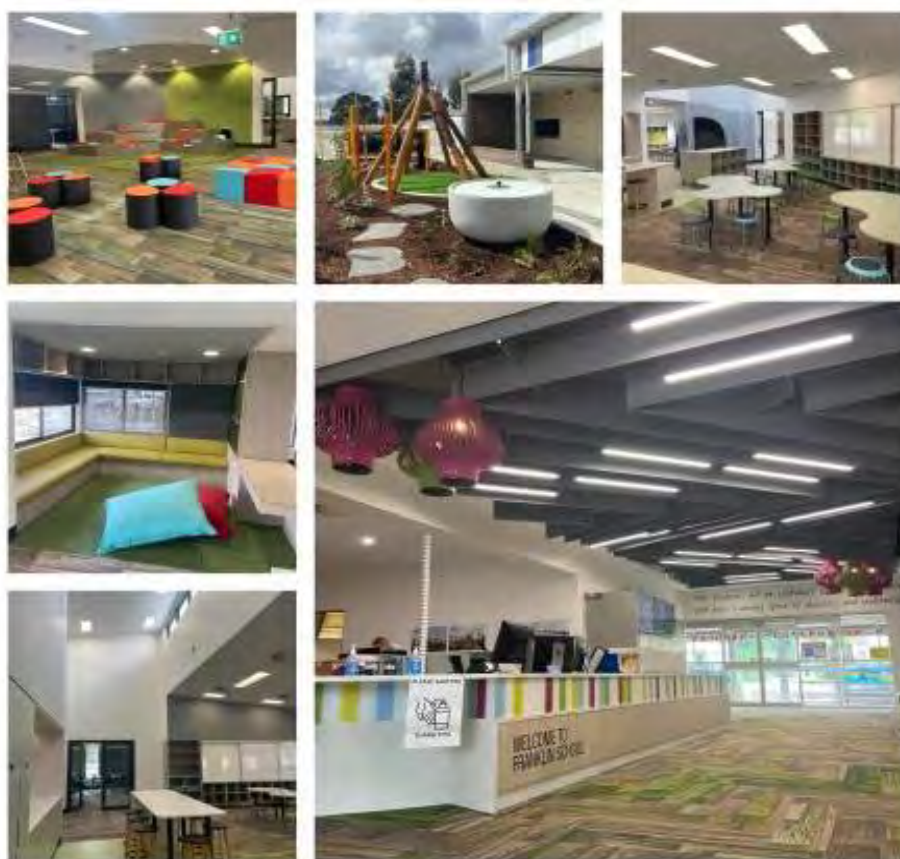
The purpose of the tuning sessions will be to ensure that systems are fully functional and optimised with regards to performance, energy efficiency and water efficiency. During the 12-month period, complete BMS remote access shall be provided to approved parties for the purposes of monitoring and analysis of performance. Data from the BMS shall be used to fine-tune control algorithms as necessary and the necessary resources shall be allocated including attending quarterly meetings and any additional time for site investigations support and system optimisation.



ACT Education Directorate

Education Directorate's Infrastructure Specification (EDIS)

Part E: Furniture, Fittings and Equipment Specification



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Part B – Functional Brief
Part C – Masterplanning and Architectural Specification
Part D – Technical Specification
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1. General

1.1. Introduction

This specification describes Furniture, Loose Fittings and Equipment (FF&E) that either have no permanent connection to the structure of the building or to services or are installed as part of the building fit-out when the base building is nearing completion.

The FF&E described within this specification also includes AV FF&E as described under the Project Agreement.

The Directorate requires that all FF&E:

- fulfils the functional requirements outlined in *EDIS: Part B – Functional Brief* for the project school type
- be robust and of good quality, capable of meeting the requirements for the intended use
- be of an aesthetic standard appropriate to the space it is located in

The Directorate takes the view that well designed and attractive furniture can enhance a space considerably and create an image that reflects the learning and teaching ethos of a school.

Innovative solutions for FF&E and use of colour throughout spaces are encouraged. Where innovative solutions are proposed, the Contractor must demonstrate how the FF&E fulfils the functional requirements specified in *EDIS: Part B – Functional Brief*. The Contractor must coordinate colour schemes for selected FF&E with the designed colour scheme for the building(s).

1.2. Accessibility and Inclusion

Consistent with the general expectation for inclusion, the Contractor must give consideration to the requirements of all Users when selecting, specifying and detailing FF&E for the Project.

1.3. Codes and Standards

FF&E provided by the Contractor must comply with the requirements of all relevant Laws and Quality Standards.

All loose furniture must meet the quality standards of all applicable Australian Standards. It is also preferred that loose furniture be approved by the Australasian Furnishing Research & Development Institute (AFRDI) or a recognised product certification scheme as listed in the Green Building Council of Australia website, such as Good Environmental Choice Australia (GECA). The FF&E schedule is to identify the certification scheme that is met and if no certification scheme, the justification for its selection.

1.4. FF&E Reference Items

FF&E reference items are items specified by naming one or more of the following: manufacturer, supplier, installer, trade name, brand name, catalogue or reference number and the like.

Trade and brand names are used in this FF&E Specification or in the appended FF&E schedules as an aid in setting the minimum level of quality required. The specification of a reference item shall not necessarily indicate mandatory or exclusive preference for the item so identified but shall be deemed to indicate the required properties of the item, such as type, quantity, appearance, finish, method of construction, performance and the like. The contractor's FF&E Schedule is to be submitted to ACT Government for review and approval by the Education Directorate at least two weeks before the order is placed.

1.5. School Procured FF&E

The School will manage a provisional sum for the purchase of some items of FF&E for the selection and quantity of items. The items procured by the School include:

-
- musical instruments
 - loose sports equipment (class sets of racquets, bats, balls, etc.), parallel bars, vaulting horses, springboards, balance balls, gym mats, etc.)
 - science equipment (e.g. laboratory equipment, scales, laboratory glassware, chemicals and similar consumables)
 - materials technology equipment, including loose machinery (not included *EDIS: Part B – Functional Brief, Appendix 3.4*) and power tools, hand tools
 - homewares for locations where food is prepared and consumed (small appliances, crockery, glassware, cutlery, cooking equipment, cooking utensils, serving plates and platters, canisters, etc)
 - office equipment (including binding machines, laminating machines, stationary items)
 - site maintenance equipment (hoses, sprinklers, lawn mowers, edge-trimmers, blowers, garden tools, etc.)

1.6. ITT Devices

The Territory will provide all Interactive Teaching Technology (ITT) devices including large format flat panel screens, Interactive Flat Panels, wall mounted ultra-short throw projectors, audio visual RGB projectors, display screens, etc.

The Contractor is to allow for provision and fitting off of backbone cabling (power, data, HDMI and MATV as applicable), and for construction support framing suitable for the weight and size of the selected devices.

1.7. Installations and Fixings

Where fittings are to be installed into a permanent location or setting, the Contractor must provide all screws, nails, bolts, anchors, brackets, adhesives, and other fixing devices required for neat and secure fixing of equipment and associated fittings throughout the Facilities.

Fixings must be selected that will provide long term secure installation and be resistant to damage, tampering and unauthorised removal. Where the installation of fittings is likely to be challenged by environmental stress or by tampering from users, positive mechanical fixings (e.g. screws) are to be used in lieu of adhesives.

Where fittings are installed in exposed, wet or damp areas or locations, fixings and accessories must be corrosion resistant materials.

Where fittings are installed onto framed walls, the Contractor must provide studs, noggings and secondary framing to provide solid support at fixing points. Plasterboard must not be used as the support substrate for installed fittings.

The Contractor must consider user requirements and other demands for wall space when selecting locations to install wall mounted fittings. It is preferred that fittings (for example a fire extinguisher), are installed near the outer edge of a length of wall (as opposed to the centre) so that the greater length of wall remains available for furniture, displays and other uses.

1.8. Spares and Accessories

Provide spare components, tools, controllers, accessories and the like where these are required for normal use and adaptation of the installed fitment or equipment. Where active FF&E is operated by a hand held remote control device, provide two devices for each control location. Devices are to be permanently labelled to identify their location and the device they operate.

1.9. Waste Management

The Contractor must manage the procurement and installation of Loose FF&E in ways that minimise the generation of packaging waste in production and delivery, and which maximise the recovery and recycling of packaging waste delivered to the site. Chlorinated or halogenated plastics must not be used in the packaging of loose FF&E items delivered to the project site.

2. Loose Furniture and Associated Equipment

2.1. General Requirements

The Contractor must supply, install or replace proprietary lines of furniture products and furnishings items, and associated items of furniture and equipment to satisfy the requirements of the *EDIS: Part B - Functional Brief* and as detailed in the 'Furniture' category of the Furniture, Fittings and Equipment Schedule as contained in this Part.

Loose furniture is deemed to comprise furniture and/or other items that are not fixed into position and which are moveable to allow for flexibility of a space including:

- chairs, stools, bench seating and seating in all other forms
- desks, tables and workstations
- mobile storage trolleys and pedestals
- bookcases and other standalone items, etc.

FF&E items must support a range of teaching and pedagogical activities where students can work independently, in small or large groups. The learning environment will be frequently re-configured to support changing learning modes through the school day and school week.

Australian manufacturers produce many lines of custom designed furniture for schools that offer opportunities to fit out spaces with functional, adaptable and attractive contemporary furniture. The Contractor is to present selections that consider complimentary design (taken from a manufacturer's coordinated range of furniture items) to deliver a coordinated and aesthetically pleasing fit-out design. To support prompt replacement of damaged or faulty items and continuity of accepted furniture landscapes, it is expected that FF&E will be selected from standard production lines sourced from reputable established manufacturers.

FF&E items must comply with the *Disability Discrimination Act (Commonwealth) 1992 (DDA)* requirements and facilitate the inclusive use of all teaching spaces.

The key requirements for loose FF&E include:

- strength, stability, durability and ease of cleaning
- ergonomic comfort for all users
- flexibility and adaptability
- mobility
- environmental sustainability

At times, some FF&E elements may be removed from learning spaces to support activities needing open spaces. Selected FF&E items should be light weight to allow them to be easily moved, and stackable or foldable to minimise storage area. Stackable items must be stable when stacked, and the Contractor's scope includes the provision of manufacturer's cradles or trolleys to move stacked FF&E items.

FF&E items must not have any sharp edges or projections or entrapment risks which could injure children or adults.

Metal carcass furniture and fittings (steel filing and storage cabinets, etc.) and metal frame elements of upholstered furniture must be finished with a durable baked powder coat finish.

Upholstery fabrics must be resistant to fire, insect attack and staining. Where fabric is used as an upholstery material the front of the upholstered component shall be in one piece between pipings, if any, with side joins at the rear or underside only.

The Contractor must make the necessary connections to the appropriate building service systems for equipment that requires connection to power, data or internal communications (if required) services. Drawings must specify the installation as part of the workstation system.

2.2. Relevant Standards

Loose furniture items must have the appropriate *Furntech - Australasian Furnishings Research Development Institute (AFRDI)* accreditation or equivalent rating to the appropriate level, and be manufactured to comply with the relevant Australian Standards, including the Certification Levels and Standards listed below or their current equivalent:

- Level 6 Task Seating – AS/NZ ISO 4438
- Level 4 Fixed Height Seating – AS/NZ ISO 4688
- Filing Cabinets – AS/NZ ISO 5079
- Quality Management Certification to AS/NZ ISO 9001

Where possible, the Contractor must source Loose Furniture from suppliers who will certify that their products comply with Green Star criteria IEQ8 Loose Furniture – Total Volatile Organic Compound (TVOC) emission limits.

2.3. Seating

In collaboration with the School, the Contractor must provide office chairs, workstation chairs, meeting room chairs, visitor chairs, and student chairs.

- Office and workstation chairs must be ergonomic design, fabric upholstered, height adjustable gas lift, swivel base, tilt back, lumbar support, with removable arms, on five castor base in accordance with AS 4438; meeting room chairs to be tubular steel frame (powdercoat finish), cushioned and fabric upholstered, with no arms. Legs must be finished with rubber or PVC stops to prevent damage to floor finishes
- Visitor waiting chairs to be tubular steel frame (powdercoat finish), cushioned and fabric upholstered, with arms. Legs must be finished with rubber or PVC stops to prevent damage to floor finishes
- Student chairs must be in a range of styles and sizes to suit student age and size, activities, and use requirements, including seated away from tables, seated at standard height tables, seated at 900mm high benches, etc. Chairs must be lightweight, but robust, easily cleaned and easily stored. Student seating may include the following seat types:
 - o stackable, moulded polypropylene seat and back (integral one piece moulding or separate seat and back), on powdercoated steel frame with robust legs or sled base in accordance with AS 4610.2. Chairs that incorporate perforated backs (for ventilation and for lifting and handling), a seat and frame configuration that permits hooking the chair over a table edge – to facilitate floor cleaning) are preferred
 - o tablet arm seats for secondary lecture/ tutorial setting (noting inclusive provision – with a proportion having left handed tablets) (Senior Secondary College only)
 - o Student stools (for work surfaces higher than 720mm table-top) must be stackable powdercoated steel frame with sled base, horizontal foot-rail, and moulded polypropylene seat
 - o Soft/ upholstered lounge style seating in library/learning resource centres for reading and quiet discussion
 - o Other soft seating
 - o Upholstered round stools and benches in a variety of shapes
 - o Seating suited for activating external learning environments (which must be warranted for regular outdoor use and be UV stabilised) that minimises the need for regular maintenance

2.4. Desks and Tables

The Contractor must provide desks and tables that comply with the following requirements:

- School tables and learning environment storage furniture in accordance with AS 4610.3
- Surfaces to be smooth, non-reflective, matt or satin finish
- Office desks (sit/stand) and returns with below desk pedestal storage unit in accordance with AS 4442
- Tables must be robust and stable. Tables will generally be laminate finish slab top, with matching 2mm thickness flexible edging and 4 tubular steel legs (powdercoated finish). Legs must be finished with rubber or PVC stops to prevent damage to floor finishes
- In staff areas, tables may be in a variety of shapes and sizes to meet the function (meeting, dining, conference, etc.), the number of users, and the proposed fitout of the space
- Meeting tables in student areas. At least two of the tables provided for each space must be with provision for adjustable height to suit wheelchair users. Other table configurations will be considered to suit the age, size and numbers of users, and the proposed fitout of the space. Table shapes and designs that facilitate different arrangements, and support multiple learning settings are preferred e.g. foldable and stackable tables with lockable castors
- Where the adult or senior student user is normally seated, work surfaces (e.g. workstations, desks, computer benches) must be 720mm above finished floor level or provided with secure, simple height adjustment
- For junior students, table heights must be suited to age levels, or provided with secure, simple height adjustment. As a guide, tables for children under 5 years old should be 600mm height
- Technology and Science benches or workstations configured to support manual tasks, project assembly and experiments must be robust and stable, suitable for holding materials (timber, metals, plastics, chemicals, etc.) for material modification and manipulation and support the use of technology tools and equipment
- Where personnel will work using a personal computer with separate screen, the equipment installation must include a height adjustable double monitor arms firmly attached to the benchtop

2.5. Book Cases

The Contractor must provide book cases that comply with the following requirements:

- Laminate finish to match other office furniture in the room or area (desk, pedestal, etc.)
- Depth 300mm – sufficient to hold A4 ring binder folders
- Adjustable shelves
- Bookcases that will be located against a wall must be no higher than 2100mm and be fixed to the wall

2.6. Sick Bay Bed

The Contractor must provide at least one single bed for a P-6 school, and two single beds for a High School or College. The bed(s) must have a powdercoat finish steel tubular frame with support slats, an adjustable back rest and a single solid foam or inner-spring upholstered mattress. Bed legs to have rubber stoppers or similar so that the floor finish is protected from damage.

2.7. Electric Adjustable Change Tables

The Contractor must supply, install and maintain electric adjustable change tables where scheduled. The supplied tables must meet the following requirements:

- height adjustable table surface – range 480mm (low) to 900mm (high)

-
- 200kg lifting capacity
 - two section adjustable patient table, 1980mm length x 700mm width, vinyl faced over 60mm foam with face hole inset into the head section
 - head and leg sections of the table to be angle adjustable – head to 85° and leg to 70°
 - powdercoat finished steel support frame with 4 legs incorporating screw thread and rubber levelling pads, and retractable wheels
 - electric motor driven, with foot switch

2.8. Waste Bins

The Contractor must provide waste bins at all locations where waste is generated, including offices, print rooms, kitchen and meals areas, toilets, and distributed through learning areas. Facilities must be designed to accommodate required bins so that bins are visible, easily accessed and do not obstruct circulation and the use of the spaces. Waste bins must be in different configurations and sizes to deal with the type and volumes of waste likely to be generated in the space, and provision of bins must facilitate and encourage separation of recyclable materials. The range of waste bins supplied must include:

- waste bins (office paper – per workstation or room)
- waste bins (food/refuse)
- waste bins (paper towels)
- sealed and sterilised feminine hygiene sanitary bins
- recycling wheelie bins (paper)
- recycling bins (glass; aluminium, steel, plastics)

A powered bin lifter is required, the Territory will provide that device.

2.9. Filing Cabinets

The Contractor must provide:

- Lateral filing cabinets in accordance with AS 5079.1
- Vertical filing cabinets in accordance with AS 5079.2. Powdercoated steel fabricated cabinets, 460mm wide x 610mm deep x standard module height to suit 2, 3 or 4 drawer as scheduled, with lockable sliding steel drawers fitted with file hanging side racks. Provide 2 sets of keys to each unit
- Mobile pedestals in accordance with AS 5079.3

2.10. Mobile Whiteboards

Where mobile whiteboards are provided to meet the requirements of *EDIS: Part B – Functional Brief*, they must comply with the following requirements:

- Mobile whiteboards must be proprietary manufactured with powdercoat tubular steel frame, rigid construction, stable base frame, and having 4 rotating castors with lock-in-place capability
- Mobile white boards used within the Facilities must be of an appropriate height to suit the learning and teaching activities of the learning setting

2.11. Lecterns

Where lecterns are provided to meet the requirements of *EDIS: Part B – Functional Brief*, they must comply with the following requirement:

-
- Lecterns must be proprietary manufactured, stable, 1200mm high with full panels to 3 sides, open shelf at 400mm from floor and sloping document shelf wide enough to hold a notebook computer, with microphone mounted on a flexible arm, and wiring for power, data and audio/visual connection

3. Fittings

3.1. Storage

3.1.1. Library Shelving Systems

The Contractor must provide library shelving systems. Shelving must be stable frames capable of storing a wide variety of information media (books large and small, DVDs, books on face display, etc.) using combinations of fully adjustable shelves of differing widths. Shelving can be proprietary modular steel, wood or laminate construction (where metal frames are used, they are required to be powder coated finish). The choice of the type of shelving must be agreed with the School.

3.1.2. Operable Storage Units (compactus)

Where identified on the FF&E Schedule, the Contractor must provide and install proprietary pre-finished steel framed compactus units comprising one fixed and multiple sliding storage units on floor mounted tracks, suitable for office and light industrial loads, and complying with AS 2143. Each unit must be fitted with slotted side walls and dividers where width requires, and 4 No pressed steel pan shelves.

Each unit must be mounted on a base of structural steel sections supporting the unit between bearings, incorporating bearing and wheel guides. Each unit must be operable by hand (without power assistance). The Contractor must provide a mechanism to lock together all continuous units in a single key operation. Provide 3 sets of keys to each unit. Multiple units in the one room or space to be keyed alike.

3.2. Student Bag Storage

Where storage for students' bags is provided to meet the requirements of *EDIS: Part B – Functional Brief*, storage must comply with the following requirements:

- be of a robust manufacture
- finished to all surfaces with facing materials that are easily cleaned, and resistant to scratching and defacement
- at a height suitable for the intended age of the students
- designed to be located close to learning spaces or within learning spaces to allow supervision
- each compartment being a suitable size to store a student's school bag, lunch bags, and personal work tray
- (where provided as a mobile unit), be light enough to be moved by staff, and able to be secured in place to prevent movement during use
- where fixed, fixtures able to be easily accessed and readily reconfigured for future location changes

3.3. Student Lockers

The Contractor must provide an individual student lockers in both the High School and College projects:

- High School – 75% of LTE is required
- College – 50% of LTE is required

Lockers must be:

- of a robust manufacture, including a fixed internal shelf
- finished so all surfaces with facing materials are easily cleaned, and resistant to scratching and defacement
- a "pitched" finished on the top to prevent rubbish, sitting and items being placed on top of the lockers
- lockable by means of padlocks

- identified by a unique number sign plate screw fixed to the locker door or case
- size, intended use and location to be determined with the school
- The height (and banking) to be determined with the school, with a maximum height 1800mm. Internal and external lines of sight (see *EDIS: Part B – Functional Brief*) must be considered when determining both location and height of lockers
- able to be secured in location, to prevent movement during use
- where fixed, fixtures able to be easily accessed and readily reconfigured for future location changes

3.4. Staff Lockers

The Contractor must provide staff clothes lockers in accordance with the requirements of *EDIS: Part B – Functional Brief* and the following outline specification:

- two tier locker units, pressed metal construction with powdercoat finish – of nominal dimensions 450mm deep x 375mm width x 1800mm total height or of laminated joinery construction, preferably of split locker type with hanging area and shelf – nominally 1400mm high x 375mm width x 450mm deep
- hinged lockable doors with latch and padlock facility
- ventilation perforations to the door panel
- provided with internal hanging rail with coat hooks plus fixed shelf

3.5. Mobile Storage Units

Mobile storage units are a preferred form of storage in learning environments. These units have several benefits: Small mobile units allow resources and tools to be brought into learning settings and activity areas when needed, with provision to be stored away from activity areas when not needed. Larger units can be used as temporary dividers. General requirements for mobile storage units include:

- Small units (single person movement) – nominal 900mm height, wipe down fixed top panel, rigid frame with dividers and single stack of removable polycarbonate storage trays, castor wheels with locking mechanism
- Larger units – refer *EDIS: Part D – Technical Specifications – Fixed Joinery section*

3.6. Steel Shelving Systems

Proprietary system of prefinished, preformed and slotted metal sections comprising vertical channels, horizontal beams, shelf supports, metal pan shelves, clips and accessories. Each unit 2400mm high x 1000mm deep x 900mm standard module width, with kick rail, fixed top and bottom shelf and 3 or 4 adjustable intermediate shelves. The unit must be fixed to the wall to prevent tipping.

3.7. Sundry Fittings

Where necessary to deliver or complement the required functionality, the Contractor must provide sundry fixtures and fittings, including:

3.7.1. School Safe and Key Storage Cabinet

The Contractor must provide a Safe and a separate key storage cabinet of heavy duty steel construction, with a resettable digital lock. Size to accommodate the number of individual keysets required for the School (nominal 60 keys or 120 keys). The cabinet must be fixed to a wall. Both to be located and secured in a space identified by the school.

3.7.2. First Aid Cabinets

The Contractor must provide a proprietary wall hung metal or PVC case first aid cabinet in each first aid room. Each cabinet must have clearly legible identifying text and a green cross graphic on the face of the door panel. Cabinet case size and quantity of contents must be suitable for school use based on the identified Peak Enrolment for the School and must conform with the requirements and contents specified in the ACT EDU *“Health and Safety Policy – First Aid” (most current edition)*.

Additional first aid cabinets must be provided in spaces in the school where there is a higher risk of injury to non-student workers on site (e.g.: the canteen, the gymnasium, science preparation rooms, materials technology workshops, etc.).

3.7.3. Sharps Container

The School will have limited requirement for sharps disposal. The First Aid room must be provided with a 2L size sealable sharps container, labelled with use and safety instructions, and suitable for placement on a benchtop.

3.7.4. Chemical Storage Cabinets (High School and Colleges only)

The Contractor must provide floor mounted, lockable chemical storage cabinets, rated for storage of oxidising and corrosive chemicals. If required for the selected cabinet, provide inlet and direct ducted outlet ventilation to each cabinet.

3.7.5. Nappy Change Bench

Where briefed or required for the reasonable functioning of the facility, provide a nappy changing station that complies with NCC clauses F2.3(g)(iii) B & C. If a proprietary fold down nappy change station is proposed that product must comply with the following minimum requirements:

- satin finish stainless steel exterior (surface mounted or semi-recessed design)
- polyethylene interior
- weight capacity not less than 110kg
- pneumatic controller to opening panel, with max 90 degrees opening
- fitted with adjustable safety belt
- step for student access as specified in *EDIS: Part B – Functional Brief for a P-6 school*

3.8. Sports Equipment

The Contractor must provide as loose fitments the requisite goals, posts, nets and the like needed to configure the school sports courts and outdoor sports fields and courts for the identified sports. Fitments must include:

Gymnasiums:

- foldaway basketball backboards complete with net, including wall mounted electric winch for retraction
- floor sockets and caps for installation of removable posts
- white vinyl faced padding to wall surfaces, goal posts, and impact risk areas
- posts and nets for futsal, volleyball, badminton and goal posts and rings for netball (where courts are sized and line marked for these sports)
- where two indoor courts adjoin, a retractable roof suspended full height net curtain must be installed. This curtain must incorporate visual barrier, 2.0m high (measured from floor level)

Outdoor courts and playing fields:

-
- fixed pole mounted combined netball ring/basketball backboards complete with net. The Contractor must provide white vinyl covered foam padding full height to steel goal posts, installed with Velcro straps
 - Multisport (incorporating Soccer and Rugby football) goal posts.

4. Equipment

4.1. Whitegoods and Large Appliances

The Contractor must supply and install large and/or fixed appliances including:

4.1.1. Stoves, Ovens and Cooktops

The minimum requirements for cooking appliances are as follows:

Stoves: Upright, stainless steel finish, with a 4 induction hotplate cooktop, griller and electric oven. Fold down door to oven. The oven must have programmable timer and temperature control on a top fascia and removable and adjustable shelves.

Ovens: Recessed mounted, multi-function electric oven with stainless steel fascia and surround, and side hinged oven door with glazed vision panel. Oven interior must include adjustable oven racks. Electric elements must deliver roast and grill cooking. Controls must include multiple heat settings, selection of cooking configurations and LED timer.

Cooktops: a 4 induction hotplate cooktop, stainless steel finish, with front or side controls.

Microwave ovens: Provide programmable multi-function domestic microwave ovens (in Staff Lounge, Canteen, Food Technology kitchens, College Student Commons, Community resource space, and other locations as identified in *EDIS: Part B – Functional Brief*), with rotating turntable, side gate glass door, illuminated digital display, and easily cleaned interior. Where the microwave oven is to be installed into a shelf of cavity in fixed joinery, the Contractor is to select appliances with dimensions that are coordinated with the relevant designed space.

4.1.2. Rangehoods and Exhaust hoods

The Contractor must provide fan driven exhaust rangehoods above stoves, cooktops and in locations where cooking processes generate heat and vapours. Exhaust rangehoods must be selected and sized to suit the service requirement. A domestic rangehood might be suitable over a single cooktop, but a commercial standard exhaust hood is required over two or more cooktops or cooking appliances (food technology areas, canteens, etc.). Exhaust rangehoods must be fitted with multi-speed fans, lights and removable filters and be ducted to external air.

4.1.3. Boiling Water Units

The Contractor must provide constant flow reticulated boiling water suitable for hot beverages, in volumes sufficient to suit the user numbers without delay for re-heating. Note for the Staff Lounge, there are peak periods at morning break and lunchtime, when most staff members will use the kitchen facilities two units are required. Locate dispenser so that drips and overflow are easily contained.

4.1.4. Chilled Water Units

The Contractor must provide constant flow reticulated chilled drinking water units for both staff and student use. The units intended for student use must be designed for filling water bottles only. Locate dispenser so that drips and overflow are easily contained. For units intended for staff or community use, subject to meeting capacity and flow requirements, the boiling water and chilled water provision can be via a single post dispenser. The number of units is determined in the relevant *EDIS: Part B – Functional Brief*.

4.1.5. Dishwashers

Domestic Dishwasher:

The Contractor must provide an underbench programmable dishwasher that complies with the following requirements:

- meet the Energy performance requirement of *EDIS – Part D, 7.11.1* (Energy ratings & WELS)

-
- multiple wash cycles including rinse and delayed start
 - drawbridge door with automatic (in-function) lock
 - stainless steel interior
 - supplied with plate and glass racks, and cutlery basket or flat rack
 - low water consumption rating
 - façade panel and door panel that can be integrated with joinery and décor

Commercial dishwasher:

The Contractor must provide a programmable dishwasher that complies with the following requirements:

- all stainless steel construction
- quick cycle high performance wash
- quick glass wash function
- low water consumption per cycle (2.5 litres target)
- drawbridge door with automatic (in-function) lock
- supplied with plate and glass racks, and cutlery basket or flat rack
- food residue filter screen;
- drain pump with backflow protection valve

Science Laboratory Glasswasher:

The Contractor must provide an underbench programmable laboratory glasswasher that complies with the following requirements:

- as for commercial dishwasher but with racks suited to laboratory glassware

4.2. Canteen Equipment

The Contractor must provide school canteens complete with equipment needed for food service, including:

- the safe storage and convenient access to materials and products relevant to the operation of a food service canteen, including manufactured comestibles and beverages (boxed, tinned, bottled, frozen, etc.) and raw foods and ingredients (refrigerated storage)
- the display of prepared hot, warm and cold meals, fruits, snacks and beverages in glass fronted display counters that maintain the food at the required temperature and protect the food from unauthorised handling and from contamination
- the storage for sale of chilled manufactured beverages and frozen foods

Fitout of canteens will include appliances for heating, baking, toasting, grilling and microwaving food. Fitout may include appliances for steaming and frying food. Canteen servery requirements refer to in *EDIS: Part B – Functional Brief* and the canteen must be fitted with an insect zapper. Provision must be made for waste management, clean up and storage of utensils, cookware, storage of class meal baskets, display of menu/food choices and prices, etc.

Without limitation, equipment in the school canteen will include commercial standard refrigerators, freezers, glass fronted beverage refrigerators, dishwashers, and stainless steel shelving.

4.3. External Play Equipment

4.3.1. Primary Play Equipment

The provision of plastic play equipment is to be minimised in designs and the provision of a variety of nature-play items is encouraged. Refer to the description in *EDIS: Part B – Functional Brief*.

Where provided, the Contractor must provide installed play equipment offering multiple modes of play, such as:

- slides
- angled or vertical poles
- scramble nets
- bridges
- climbing frames
- stepped decks
- steering wheel panel
- shop front window

Play equipment must be distributed around the School grounds to suit the student populations of the School, with defined play zones for different age levels, and with provision for students with specific needs. Play equipment must offer stimulation and a sense of challenge, applicable to the respective age groups.

Play equipment must be of proprietary manufacture, with demonstrable compliance with relevant Quality Standards and Laws. The equipment must be free of entrapment points, free of pinch points, and without dangerous projections and sharp edges. All elements of on-site installation (bolt heads, pad footings and the like) must be buried, capped and protected so that there is no risk of injury to students.

4.3.2. Secondary School Physical Exercise Equipment

The Contractor must provide installed outdoor physical exercise equipment offering the opportunity for secondary students to complete a fitness and exercise circuit around the School campus, preferably aligned with a circuit path or jogging route. Exercise areas should contain a range of exercise functions using installations suited to outdoor exposure, including:

- low height balance beams
- chin-up bars
- stretch bars
- push-up and sit-up benches
- step-up planks
- push up frames
- outdoor cross trainers

Signage must be provided at the start of the circuit and at each location, identifying the equipment provided, the exercise options available, and suggested exercise repetition sequences.

4.4. Secondary School Science, Technology, and Arts equipment

4.4.1. Kiln – 3D Art

The Contractor must supply and install a large (preferred size is 340L) front load craft kiln capable of containing the work of multiple students, and suitable for the firing of glazed ceramics and enamelling on metalwork. The kiln must be capable of fast firing to 1300°C. If installed inside a building, the kiln must be provided with a high temperature fume exhaust system and make up air intake. If installed outside a building, the kiln must be suitable for long term external exposure and housed in a security and weather protection enclosure that will not be degraded by exposure to high temperatures or high temperature fume exhaust.

Each kiln must be supplied complete with a range of kiln-ware (including shelf trays, props and stands) sufficient to enable the kiln to be fully and securely stacked with multiple pieces of work in a variety of sizes.

4.4.2. Clay Pug Mill – 3D Art

The Contractor must supply and install a single phase electric motor driven claypug mill, capable of 180kg/hr production with a 75mm diameter nozzle from a 130mm barrel. The barrel must split longitudinally for cleaning and be assembled using stainless steel barrel bolts.

4.4.3. Potter's Wheel – 3D Art

The Contractor must provide – where scheduled – potter's wheels that comply with the following outline specification:

- 330mm wheel head
- wired foot pedal
- 550w direct drive electric motor
- stainless steel body and legs
- cast aluminium splash tray with drain spout that can direct liquid waste to a bucket
- weight – approx. 25kg
- provide with clip-on seat (stainless steel frame and padded seat)

4.4.4. Technology Machinery & Equipment

The required list of for Technology inclusions is located at *EDIS: Part B – Functional Brief, Appendix 3.4.*

4.4.5. Materials Technology Workbench

A four person materials technology workbench manufactured to allow easy adaption to support multiple tasks and activities using optional accessories. The workbench must include four corner mounted steel vices (including pine false jaws) must have provision for the installation of hold down clamps, jigs and other accessories in multiple locations around the level work surface. The bench must be stable and of heavy duty construction, with capacity to support heavy items of equipment, heavy materials and large items of project work.

4.4.6. Flame cutting, Soldering and Welding Benches

A steel construction bench purpose designed to support safe flame cutting, soldering and welding activities. The requirements for these inclusions is located at *EDIS: Part B – Functional Brief, Appendix 3.4.*

Additionally the bench must have two work areas, comprising:

- a grated flame cutting and welding area with spark arrester shield above bench and a metal quench pan below the spark funnel
- an area of refractory bricks set flush with the work surface to support welding and brazing actions while preventing heat transfer to the bench top or frame

The bench must be fitted with wheels to permit relocation, with a locking function to ensure stability when in use.

From: [Stewart, Ell](#) on behalf of [EDU, EBM AMD](#)
To: [Player, Ben](#)
Cc: [EDU, EBM AMD](#)
Subject: FW: QON FOR ADVICE - FOR ACTION: FOL26/125 - QON [REDACTED] 1098 and [REDACTED]
Date: Thursday, 14 May 2026 10:17:54 AM
Attachments: [QON 1098 Answer - Barry MLA - Schools \(Strathnairn School - Environmental Safety\).DOCX](#)

OFFICIAL

Ben, JN advice below re QON 1098 as mentioned can we have a chat please

Thanks
Ell

From: Nakkan, John <John.Nakkan@act.gov.au>
Sent: Thursday, 14 May 2026 9:31 AM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Subject: RE: QON FOR ADVICE - FOR ACTION: FOL26/125 - QON [REDACTED] 1098 and [REDACTED]

OFFICIAL

Hi Ell,

For Q1 – I think the answer is as you have written it, but please check with People and Performance, School Ops and the WHS team in case there is any routine monitoring programs in place. These would not be specifically about Strathnairn.

Q4 and 5 – there was monitoring done of emissions from LMWQCC during the planning approval process before DA approval, however I think this question is in relation to any emissions from the former Belconnen Tip. There were no caveats in place, such as a requirement to undertake monitoring, when we got DA approval. I'm pretty sure that EDU doesn't do any monitoring, nor are we required to, RSEM can confirm. Also, I don't think that the location of the school is actually on the tip site. There are known exclusion zones in Macnamara which is on top of the old tip. When RSEM confirm that no monitoring is done, we could potentially refer question 4 to CED and whoever in the old EPSDD has regulatory responsibility for the remediation of the Belconnen tip.

Regards,

John Nakkan | Executive Branch Manager
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From: Stewart, Ell <Ell.Stewart@act.gov.au> **On Behalf Of** EDU, EBM AMD

Sent: Thursday, 14 May 2026 9:05 AM

To: Nakkan, John <John.Nakkan@act.gov.au>

Cc: EDU, EBM AMD <EBM.AMD@act.gov.au>

Subject: FW: QON FOR ADVICE - FOR ACTION: FOL26/125 - QON [REDACTED] 1098 and [REDACTED]

OFFICIAL

Thanks John, will request input accordingly

Also some advice please regarding the Strathnairn environmental safety QON 1098 (attached) –

- Ben has advised AMD can't answer Q1 – can we say 'The government has not undertaken any assessment' or should I speak to the school or school ops?
- Please advise on Q4 and Q5 – can we say 'assuming they are referring to the LMQWCC'? and Q5 - Should we seek RSEM or school input?

Thanks John

Ell



From: Do, Patrick <Patrick.Do@act.gov.au> **On Behalf Of** EDU, Cabinet & Assembly
Sent: Monday, 11 May 2026 4:46 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Nakkan, John <John.Nakkan@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>; Burn, Emma <Emma.Burn@act.gov.au>; EDU, Cabinet & Assembly <EDUCabinetAssembly@act.gov.au>
Subject: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 and [REDACTED]

OFFICIAL

Good afternoon,

Please see below for action.

ASSEMBLY Question on Notice Response Request	
TRIM Number	FOL26/125
Branch and Title	AMD QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD
Action(s)	1. Prepare QON response (template in TRIM) 2. Complete QON costing tool (template in TRIM) Please liaise with other BUs as required.
Response type	Question on Notice (QON)
Clearance level required	EGM
Date due to EDUCabinetAssembly@act.gov.au	22 May 2026
Date Due to MO	22 May 2026
Further information	Please be reminded of the following: • QON responses should be concise and directly relevant to the subject matter of the question; • If relevant data is not readily available, or the Directorate does not centrally collect the information being requested, please let EDUCabinetAssembly@act.gov.au know as soon as possible – do not try and create data. • There is the option for Directorates to decline to answer the questions based on it being an unreasonable diversion of resources.
Comment	• Please contact EDUCabinetAssembly@act.gov.au if you have any questions. • QON paper in TRIM for your reference.

Kind regards

Patrick Do | A/g Assistant Director - Ministerial, Assembly and Cabinet

Phone: via MS Teams | Email: EDUCabinetAssembly@act.gov.au or patrick.do@act.gov.au

Ministerial & Corporate Reporting – Communication, Engagement and Government Service
Branch| Education Directorate| ACT Government

220 London Circuit, Canberra City, ACT 2601 | GPO Box 158 Canberra ACT 2601

Response to question on notice

Questions on Notice Paper No 19

8 May 2026

Question No. 1098

MS CHIKA BARRY MLA: To ask the Minister

1. What assessment has the Government undertaken of illness incidence, including respiratory illness and absenteeism, at Strathnairn school compared to other ACT public schools.
2. What role, if any, has been identified for reduced airflow and airtight passive design features.
3. What
 - (a) ventilation standards,
 - (b) air exchange rates and
 - (c) indoor air quality monitoring regimes apply to Strathnairn school and have any
 - (d) deficiencies,
 - (e) complaints and
 - (f) remedial actions been identified since opening.
4. What monitoring occurs at Strathnairn School of fugitive methane or other toxic gas levels related to the waste facility.
5. What emergency response plans are in place should the levels referred to in part (4) become toxic.
6. What design and maintenance issues have arisen from the transition between carpet and hard flooring surfaces at Strathnairn school, including
 - (a) cleaning effectiveness,
 - (b) staining and
 - (c) lifecycle cost.
7. Will the design approach referred to in part (6) be revised for future school builds.

MS YVETTE BERRY MLA - The answer to the Member's question is as follows:

1. **AMD does not have this data.**

act.gov.au

2. Airflow and airtight passive design of the Strathnairn School have been designed to Australian Standards (AS), National Construction Code (NCC) and the Education Directorate's Infrastructure Specifications (EDIS).
3. Ventilation standards, air exchange rates and indoor air quality have been designed to AS, NCC and EDIS. Indoor air quality is monitored through various CO2 sensors within the buildings feeds that information into the school's Building Management System (BMS). As the school has only opened Stage 1 at the start of the 2026 there is limited data to identify discrepancies in the system, however, there have been no complaints about air quality in the Stage 1 spaces. With the transition from summer to winter the school has raised some complaints regarding temperatures within the administration spaces. Remedial actions have taken place with temperature setpoints being adjusted in these spaces.
4. Clarification required on 'waste facility', assuming the reference might be for the Lower Molonglo Water Quality Control Centre. There are no sensors installed to monitor fugitive methane or other toxic gas levels at the school site, this is consistent with other ACT Government Schools. The Lower Molonglo Water Quality Control Centre monitors air quality in and around the facility, to date the Education Directorate has not received any notification of concerns in external air quality.
5. Not an AMD response. This would be a RSEM or School response.
6. There have been no design or maintenance issues raised at the school in relation to the transition between carpet and hard flooring surfaces at the Strathnairn School. The transition between carpet and hard flooring surfaces is consistent with all ACT Government Schools.
7. The Education Directorate and Infrastructure Canberra review and capture lessons learnt for future school builds based.

Approved for circulation to the Member and incorporation into Hansard.

Yvette Berry MLA
Minister for Education and Early Childhood

Date:

This response required XXhrs XXmins to complete, at an approximate cost of \$XXX.

From: [Stewart, Ell](#) on behalf of [EDU, EBM AMD](#)
To: [Nakkan, John](#)
Cc: [EDU, EBM AMD](#)
Subject: FW: QON Response RSEM
Date: Monday, 18 May 2026 8:29:00 AM
Attachments: [QON 1098 Answer - Barry MLA - Schools \(Strathnairn School - Environmental Safety\).DOCX](#)

OFFICIAL

John, FYI response from RSEM re QON questions – gives some context anyway

Ell

From: Allen, Tracey <Tracey.Allen@act.gov.au>
Sent: Friday, 15 May 2026 1:38 PM
To: Stewart, Ell <Ell.Stewart@act.gov.au>
Cc: Aquilina, Christopher <Christopher.Aquilina@act.gov.au>; Laurent, Kristen <Kristen.Laurent@act.gov.au>
Subject: QON Response RSEM

OFFICIAL

Hey Ell

As discussed if there was an issue at the Lower Molonglo Water Quality Control Centre, the risk owner, City and Environment Directorate (owner of the site) and ICON Water who manage the site, would be responsible for notifying both the Justice and Community Safety Directorate and ACT Health Directorate that there was an issue. Depending on what that issue is, such as toxic fumes, a whole of Govt. activation through ACT Health or the Emergency Coordination Centre would be required where the most appropriate Hazard Sub Plan would be enacted.

The school would not require an Emergency Response Plan directly related to toxic gas levels as it would be a whole community issue with the school and the residents all affected, hence the requirement for a Whole of Government response and advice.

The school does have an Emergency Response procedure for localised (school based hazards). All other hazards are managed by the ACT Emergency Plan and ACT Emergency Management arrangements.

Any further questions please reach out.

Cheers

Tracey Allen ESM | Senior Director Risk, Security and Emergency Management | Agency Security Advisor

Phone: via Teams 620 77007; | Email: tracey.allen@act.gov.au |
Duty Phone: 0447 882 754: EDUSecurityandEmergency@act.gov.au

Governance Branch | Education Directorate

GPO Box 158 Canberra 2601 CANBERRA ACT 2601

Receiving this email outside of normal working hours? Managing work and life responsibilities is unique for everyone and is supported by my employer. I have sent this email at a time that works for me. You are not expected to respond outside of your regular work hours.

From: [Williams, Mark-X](#)
To: [EDU, School Cleaning](#); [Namgay, Namgay](#); [Foote, Robert](#)
Subject: RE: Request for Information - Question on Notice Input - Strathnairn School
Date: Thursday, 21 May 2026 2:04:36 PM
Attachments: [processed-76DB8010-2D41-4E47-B64A-CE31E73AE63C.jpeg](#)
[processed-311DC6EB-26E1-4F19-AA07-DDD8057D5817.jpeg](#)
[processed-40A1DFB8-E0C5-4D4F-91BF-149DD8BE0F75.jpeg](#)
[image001.png](#)

OFFICIAL

Good afternoon,

Following a recent site inspection, several issues were identified relating to the interface between carpet and vinyl flooring throughout the facility.

In multiple locations, carpet is installed directly adjacent to vinyl flooring at the same level, without a clearly defined transition strip or edge detail. This presents operational challenges for cleaning activities, as routine mopping and machine scrubbing of hard floors introduces water, which may migrate into the adjoining carpeted areas.

The absence of a defined edge also creates a risk of damage during cleaning, as the use of scrubbing machines along exposed carpet edges is likely to cause fraying or deterioration. Further, several sections of carpet appear to be inadequately installed, with visible signs of edges fraying and carpet threads pulling away.

These issues may impact both the longevity of the flooring and the effectiveness and safety of cleaning processes.

Kind Regards

Mark Williams

School Cleaning Coordinator CSO4 Belconnen Network (Acting)

Phone: 0466 563 634

ISSA Accredited Auditing Professional

School Cleaning Service|Schools Facilities Management Branch|

Infrastructure and Digital Services Group|Education|ACT Government

HBCTL, 51 Fremantle Drive, Striling, ACT 2611

From: Polglase, Karen <Karen.Polglase@act.gov.au> **On Behalf Of** EDU, School Cleaning

Sent: Thursday, 21 May 2026 10:59 AM

To: Namgay, Namgay <Namgay.Namgay@act.gov.au>; Foote, Robert

<Robert.Foote@act.gov.au>; Williams, Mark-X <Mark-X.Williams@act.gov.au>

Subject: FW: Request for Information - Question on Notice Input - Strathnairn School

Importance: High

OFFICIAL

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Thursday, 21 May 2026 10:33 AM
To: EDU, School Cleaning <schoolcleaning@act.gov.au>
Subject: Request for Information - Question on Notice Input - Strathnairn School
Importance: High

OFFICIAL

Good Morning Team,

We have received a Question on Notice regarding the Strathnairn School. One of the questions received relates to cleaning, it is –

What design and maintenance issues have arisen from the transition between carpet and hard flooring surfaces at Strathnairn school, including
(a) cleaning effectiveness,
(b) staining and
(c) lifecycle cost.

I have discussed with the school already who have advised there have been no issues reported to them between the transition of carpet and hard flooring.

Are you able to advise if the cleaners have reported anything directly to your team?

Regards

Ben Player
Senior Director, Major Projects | Asset Management and Delivery
P 0421 162 123 | E ben.player@act.gov.au
Education | ACT Government
www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)
GPO Box 158 Canberra ACT 2601



We acknowledge the traditional custodians of the lands and waters where we live and learn, and pay our respects to elders past, present, and future.







From: [Nakkan, John](#)
To: [EDU, EBM AMD](#)
Cc: [Player, Ben](#)
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098
Date: Friday, 22 May 2026 3:21:00 PM
Attachments: [image001.png](#)
[QON 1098 Answer - Barry MLA - Schools \(Strathnairn School - Environmental Safety\).DOCX](#)

Hi Ell,

In reviewing Nessa's comments, we are going to have to check with Access Canberra about the LMWQCC reporting (Question 5). We will also need to recheck with School Cleaning Services for Question 6. Robert Foote mentioned something about floor transitions in our lessons learned workshop yesterday but we didn't get the opportunity to follow up with him about this we ran over time and had to go to other commitments.

I have responded to the other comments.

Regards,

John Nakkam | Executive Branch Manager
 Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkam@act.gov.au
 Asset Management and Delivery | Education | ACT Government
 Level 4, 220 London Circuit | GPO Box 158 Canberra ACT 2601
 Ngunnawal Country
www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

From: Stewart, Ell <Ell.Stewart@act.gov.au> **On Behalf Of** EDU, EBM AMD
Sent: Friday, 22 May 2026 1:42 PM
To: Nakkam, John <John.Nakkam@act.gov.au>
Cc: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>
Subject: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi John, re EGM comments in attached Strathnairn QON (air quality) -

- I already emailed P&P and WH&S on 14/5 – they had nil input
- I spoke to Complaints team this am – nil input
- School Ops said check with the school – as stated in the QON no complaints have been received by EDU about air quality in facilities delivered through Stage 1 of the School, and noting the relationship AMD has built with the school any concerns with the issues in the QON would immediately be notified to AMD. The only issues were some concerns with temperatures within administration spaces with the seasonal transition
- Ben spoke to SCS who said nil input
- We have not had a response since asking yesterday about the EPA monthly performance results. For your advice please what do u want to respond on that one John?

Please advise if we can progress back to IDSO (who are chasing this) If you are satisfied with that level of investigation? For return to EGM as soon as possible

Thank you
 Ell

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Wednesday, 20 May 2026 5:33 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: Nakkam, John <John.Nakkam@act.gov.au>
Subject: RE: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell,

I can check with P&P/School Ops/Complaints and SCS, noting the relationship with have built with the school that if there were any concerns with the issues in the QON we would be the first to know. I can see if I still have a contact with for the water quality plant from when we did the planning and monitoring as part of the estate development.

Regards

Ben Player
 Senior Director, Major Projects | Asset Management and Delivery
 P 0421 162 123 | E ben.player@act.gov.au
Education | ACT Government
www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)
 GPO Box 158 Canberra ACT 2601



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From: Stewart, Ell <Ell.Stewart@act.gov.au> **On Behalf Of** EDU, EBM AMD
Sent: Wednesday, 20 May 2026 4:27 PM
To: Player, Ben <Ben.Player@act.gov.au>
Cc: Nakkam, John <John.Nakkam@act.gov.au>; EDU, EBM AMD <EBM.AMD@act.gov.au>
Subject: FW: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ben

Please review EGM comments in the QON 1098 - I think I can check the comments with P&P/School ops/Complaints and SCS. Can you please check about the Access Canberra comment? Or let me know if you want to do it differently – we need to return by COB tomorrow

Thank you
Ell

From: EDU, EGMIDS <EGMIDS@act.gov.au>
Sent: Wednesday, 20 May 2026 4:13 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>
Subject: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell

Nessa has reviewed and left some comments to be addressed to QON 1098. If you are able to return by COB tomorrow please.

Thanks

Jess

From: Stewart, Ell On Behalf Of EDU, EBM AMD
Sent: Tuesday, 19 May 2026 4:39 PM
To: EDU, EGMIDS
Cc: EDU, EBM AMD
Subject: FOR CLEARANCE: FOR ACTION: FOL26/125 - QONs 1098 [REDACTED]

OFFICIAL

Good afternoon

Clearance Advice	
Title	QON 1098 [REDACTED]
TRIM No	FOL26/125
TRIM admin	- Action tree updated (if there is one) Y - Comment added in Notes Y - Documents all checked-in – Y
EBM Approved	yes – AMD 19/5
Any other ESO engagement	
Clearance due date/Critical Date	due to MCR Fri 22/5
Critical date reason (if applicable)	
Context/Background information for clearance	
Additional Comments. Next steps, after EGM clearance	progress QONs 1098 [REDACTED] to MCR

Thank you
Ell

From: Nakkan, John <John.Nakkan@act.gov.au>
Sent: Tuesday, 19 May 2026 4:35 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>; Gumley, Clair <Clair.Gumley@act.gov.au>
Subject: RE: FOR CLEARANCE: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 [REDACTED]

OFFICIAL

Hi Ell,

Both QON 1098 [REDACTED] are cleared from AMD Branch.

Thanks Clair and Ben for drafting.

Regards,

John Nakkan | Executive Branch Manager
Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
Asset Management and Delivery | Education | ACT Government
Level 4, 220 London Circuit | GPO Box 158 Canberra ACT 2601
Ngunnawal Country
www.education.act.gov.au | Facebook | Twitter | Instagram | LinkedIn

From: Do, Patrick <Patrick.Do@act.gov.au> On Behalf Of EDU, Cabinet & Assembly
 Sent: Monday, 11 May 2026 4:46 PM
 To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Nakkan, John <John.Nakkan@act.gov.au>
 Cc: EDU, EGMIDS <EGMIDS@act.gov.au>; Burn, Emma <Emma.Burn@act.gov.au>; EDU, Cabinet & Assembly <EDUCabinetAssembly@act.gov.au>
 Subject: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 and [REDACTED]

OFFICIAL

Good afternoon,

Please see below for action.

ASSEMBLY Question on Notice Response Request	
TRIM Number	FOL26/125
Branch and Title	AMD QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD
Action(s)	1. Prepare QON response (template in TRIM) 2. Complete QON costing tool (template in TRIM) Please liaise with other BUs as required.
Response type	Question on Notice (QON)
Clearance level required	EGM
Date due to EDUCabinetAssembly@act.gov.au	22 May 2026
Date Due to MO	22 May 2026
Further information	Please be reminded of the following: - QON responses should be concise and directly relevant to the subject matter of the question; - If relevant data is not readily available, or the Directorate does not centrally collect the information being requested, please let EDUCabinetAssembly@act.gov.au know as soon as possible – do not try and create data. - There is the option for Directorates to decline to answer the questions based on it being an unreasonable diversion of resources.
Comment	- Please contact EDUCabinetAssembly@act.gov.au if you have any questions. - QON paper in TRIM for your reference.

Kind regards

Patrick Do | A/g Assistant Director - Ministerial, Assembly and Cabinet
 Phone: via MS Teams | Email: EDUCabinetAssembly@act.gov.au or patrick.do@act.gov.au
 Ministerial & Corporate Reporting – Communication, Engagement and Government Service Branch | Education Directorate | ACT Government
 220 London Circuit, Canberra City, ACT 2601 | GPO Box 158 Canberra ACT 2601

Response to question on notice

Questions on Notice Paper No 19

8 May 2026

Question No. 1098

MS CHIKA BARRY MLA: To ask the Minister

1. What assessment has the Government undertaken of illness incidence, including respiratory illness and absenteeism, at Strathnairn school compared to other ACT public schools.
2. What role, if any, has been identified for reduced airflow and airtight passive design features.
3. What
 - (a) ventilation standards,
 - (b) air exchange rates and
 - (c) indoor air quality monitoring regimes apply to Strathnairn school and have any
 - (d) deficiencies,
 - (e) complaints and
 - (f) remedial actions been identified since opening.
4. What monitoring occurs at Strathnairn School of fugitive methane or other toxic gas levels related to the waste facility.
5. What emergency response plans are in place should the levels referred to in part (4) become toxic.
6. What design and maintenance issues have arisen from the transition between carpet and hard flooring surfaces at Strathnairn school, including
 - (a) cleaning effectiveness,
 - (b) staining and
 - (c) lifecycle cost.
7. Will the design approach referred to in part (6) be revised for future school builds.

MS YVETTE BERRY MLA - The answer to the Member's question is as follows:

1. Nil. The Education Directorate (the directorate) does not undertake this type of assessment.

act.gov.au

2. Airflow and airtight passive design of the Strathnairn School have been designed to Australian Standards (AS), National Construction Code (NCC) and the directorate's Education Design Infrastructure Specifications (EDIS).
3.
 - a. Ventilation standards, air exchange rates and indoor air quality have been designed to AS, NCC and EDIS.
 - b. Ventilation standards, air exchange rates and indoor air quality have been designed to AS, NCC and EDIS
 - c. Ventilation standards, air exchange rates and indoor air quality have been designed to AS, NCC and EDIS. Indoor air quality is monitored through various CO₂ sensors within the buildings which feed information into the school's Building Management System (BMS).
 - d. As the school has only opened Stage 1 at the start of the 2026, there is limited data available to identify discrepancies in the system.
 - e. No complaints have been received by the Directorate about air quality in facilities delivered through Stage 1 of the School. With the seasonal transition from summer to winter, the school has raised some complaints regarding temperatures within administration spaces.
 - f. Remedial actions have taken place with temperature setpoints being adjusted in these spaces.
4. It is assumed the 'waste facility' referred to is either the Lower Molonglo Water Quality Control Centre (LMWQCC), or the former Belconnen waste facility/tip, no longer in use. There are no sensors installed to monitor fugitive methane or other toxic gas levels at the school. The LMWQCC operates subject to an Environmental Authorisation issued by the ACT Environmental Protection Authority (EPA) under the ACT Environment Protection Act 1997 (ACT). Performance results are reported to the EPA monthly. The Education Directorate has not received any notification of concerns about external air quality.
5. The site owner, City and Environment Directorate and site manager, ICON Water, would be responsible for notifying both the Justice and Community Safety and ACT Health Directorates of the issue. Depending on the extent of the issue, a Whole of Government activation through ACT Health or Emergency Coordination Centre would be required where the most appropriate Hazard Sub-Plan would be enacted.
6. The Education Directorate is not aware of design or maintenance issues have arisen from the transition between carpet and hard flooring surfaces at Strathnairn School.
7. The directorate incorporates changes to EDIS and updates design from time to time, informed by outcomes and feedback arising from recent infrastructure delivery.

Approved for circulation to the Member and incorporation into Hansard.

Yvette Berry MLA
Minister for Education and Early Childhood

Date:

This response required 180 minutes to complete, at an approximate cost of \$335.22.

From: [Player, Ben](#)
To: [Bacon, Patrick](#); [Peek, Rohan](#)
Subject: RE: EPA Question
Date: Friday, 22 May 2026 3:59:00 PM
Attachments: [image001.png](#)

Hi Pat,

Thanks for the update. The question wasn't clear, it just referenced 'waste facility'.

Regards

Ben Player

Senior Director, Major Projects | Asset Management and Delivery

P 0421 162 123 | E ben.player@act.gov.au

Education | ACT Government

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GPO Box 158 Canberra ACT 2601



We acknowledge the traditional custodians of the lands and waters where we live and learn, and pay our respects to elders past, present, and future.

From: Bacon, Patrick <Patrick.Bacon@act.gov.au>
Sent: Friday, 22 May 2026 3:33 PM
To: Player, Ben <Ben.Player@act.gov.au>; Peek, Rohan <Rohan.Peek@act.gov.au>
Subject: RE: EPA Question

OFFICIAL

G'day Ben,

I have sent on to our contaminated sites team who manage emissions, air quality etc.,

In the meantime, do you know if the complaint/question is in relation to the old West Belconnen landfill stacks/site, or the LMWQCC incinerator or odour?

Regards,

Patrick Bacon | Assistant Director | Water Regulation, Office of the Environmental Protection Authority

Phone: 02 6207 2142 | **Email:** patrick.bacon@act.gov.au

Environment, Land and Technical Regulation | City and Environment Directorate | ACT Government
Level 5 480 Northbourne Avenue, Dickson 2602 | GPO Box 158, Canberra ACT 2601 |

www.act.gov.au/environment

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Friday, 22 May 2026 3:23 PM
To: Peek, Rohan <Rohan.Peek@act.gov.au>; Bacon, Patrick <Patrick.Bacon@act.gov.au>
Subject: Re: EPA Question

OFFICIAL

Thanks Rohan.

Pat are you able to advise?

Regards

Ben

Get [Outlook for iOS](#)

From: Peek, Rohan <Rohan.Peek@act.gov.au>
Sent: Friday, May 22, 2026 12:42:20 PM
To: Player, Ben <Ben.Player@act.gov.au>; Bacon, Patrick <Patrick.Bacon@act.gov.au>
Subject: RE: EPA Question

OFFICIAL

Hi Ben,

Pat Bacon looks after the Authorisation for LMWQCC So he would be your best contact in EPA, I've copied him in.

Cheers

Rohan Peek | EPA Industry Liaison Officer
Phone: 02 6207 5479 | Email: rohan.peek@act.gov.au
Office of the Environment Protection Authority | Access Canberra | ACT Government
480 Northbourne Avenue, Dickson 2602
GPO Box 158 Canberra ACT 2601

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Friday, 22 May 2026 12:39 PM
To: Peek, Rohan <Rohan.Peek@act.gov.au>
Subject: EPA Question

OFFICIAL

Hey Rohan,

I've got a question from left field which I'm hoping you might be able to help with.

We received a question on notice regarding the Strathnairn School. One of the questions relates to 'monitoring of methane or other toxic gas levels related to the waste facility'. Our assumption of 'waste facility' is the Lower Molonglo Water Quality Control Centre (LMWQCC). We (EDU) do not do any monitoring of air external air quality from those facilities, however I note from the LMWQCC they state 'The LMWQCC operates subject to an Environmental Authorisation issued by the ACT Environmental Protection Authority (EPA) under the ACT Environment Protection Act 1997 (ACT). Performance results are reported to the EPA monthly.'

Do you know if this is correct and performance results are reported to the EPA? I just wanted to double check before I finish it off.

Regards

Ben Player

Senior Director, Major Projects | Asset Management and Delivery

P 0421 162 123 | E ben.player@act.gov.au

Education | ACT Government

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GPO Box 158 Canberra ACT 2601



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From: [Player, Ben](#)
To: [Nakkan, John](#); [EDU, EBM AMD](#)
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098
Date: Friday, 22 May 2026 4:15:00 PM
Attachments: [image001.png](#)

Hi John and Ell,

I'm waiting to hear back from EPA, I have been bounced around to a few different areas without an answer. Still chasing though!
 I did catch Robert a little later at HBCTL. He mentioned the transition between hard flooring and carpet may cause concerns with cleaning and wear and tear, given they butt up to each other. However looking at how it's been installed it meets EDIS requirements and isn't any different to the transition at other schools.

Regards

Ben Player
 Senior Director, Major Projects | Asset Management and Delivery
 P 0421 162 123 | E ben.player@act.gov.au
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www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)
 GPO Box 158 Canberra ACT 2601



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From: Nakkan, John <John.Nakkan@act.gov.au>
Sent: Friday, 22 May 2026 3:21 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: Player, Ben <Ben.Player@act.gov.au>
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell,

In reviewing Nessa's comments, we are going to have to check with Access Canberra about the LMWQCC reporting (Question 5). We will also need to recheck with School Cleaning Services for Question 6. Robert Foote mentioned something about floor transitions in our lessons learned workshop yesterday but we didn't get the opportunity to follow up with him about this we ran over time and had to go to other commitments.

I have responded to the other comments.

Regards,

John Nakkan | Executive Branch Manager
 Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
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 Level 4, 220 London Circuit | GPO Box 158 Canberra ACT 2601
 Ngunnawal Country
www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

From: Stewart, Ell <Ell.Stewart@act.gov.au> **On Behalf Of** EDU, EBM AMD
Sent: Friday, 22 May 2026 1:42 PM
To: Nakkan, John <John.Nakkan@act.gov.au>
Cc: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>
Subject: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi John, re EGM comments in attached Strathnairn QON (air quality) -

- I already emailed P&P and WH&S on 14/5 – they had nil input
- I spoke to Complaints team this am – nil input
- School Ops said check with the school – as stated in the QON no complaints have been received by EDU about air quality in facilities delivered through Stage 1 of the School, and noting the relationship AMD has built with the school any concerns with the issues in the QON would immediately be notified to AMD. The only issues were some concerns with temperatures within administration spaces with the seasonal transition
- Ben spoke to SCS who said nil input
- We have not had a response since asking yesterday about the EPA monthly performance results. For your advice please what do u want to respond on that one John?

Please advise if we can progress back to IDSO (who are chasing this) If you are satisfied with that level of investigation? For return to EGM as soon as possible

Thank you
 Ell

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Wednesday, 20 May 2026 5:33 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: Nakkan, John <John.Nakkan@act.gov.au>
Subject: RE: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Eli,

I can check with P&P/School Ops/Complaints and SCS, noting the relationship with have built with the school that if there were any concerns with the issues in the QON we would be the first to know. I can see if I still have a contact with for the water quality plant from when we did the planning and monitoring as part of the estate development.

Regards

Ben Player

Senior Director, Major Projects | Asset Management and Delivery

P 0421 162 123 | E ben.player@act.gov.au

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GPO Box 158 Canberra ACT 2601



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From: Stewart, Eli <Eli.Stewart@act.gov.au> On Behalf Of EDU, EBM AMD

Sent: Wednesday, 20 May 2026 4:27 PM

To: Player, Ben <Ben.Player@act.gov.au>

Cc: Nakkan, John <John.Nakkan@act.gov.au>; EDU, EBM AMD <EBM.AMD@act.gov.au>

Subject: FW: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ben

Please review EGM comments in the QON 1098 - I think I can check the comments with P&P/School ops/Complaints and SCS. Can you please check about the Access Canberra comment? Or let me know if you want to do it differently – we need to return by COB tomorrow

Thank you

Eli

From: EDU, EGMIDS <EGMIDS@act.gov.au>

Sent: Wednesday, 20 May 2026 4:13 PM

To: EDU, EBM AMD <EBM.AMD@act.gov.au>

Cc: EDU, EGMIDS <EGMIDS@act.gov.au>

Subject: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Eli

Nessa has reviewed and left some comments to be addressed to QON 1098. If you are able to return by COB tomorrow please.

Thanks

Jess

From: Stewart, Eli On Behalf Of EDU, EBM AMD

Sent: Tuesday, 19 May 2026 4:39 PM

To: EDU, EGMIDS

Cc: EDU, EBM AMD

Subject: FOR CLEARANCE: FOR ACTION: FOL26/125 - QONs 1098

OFFICIAL

Good afternoon

Clearance Advice	
Title	QON 1098
TRIM No	FOL26/125
TRIM admin	- Action tree updated (if there is one) Y - Comment added in Notes Y - Documents all checked-in – Y
EBM Approved	yes – AMD 19/5
Any other ESO engagement	
Clearance due date/Critical Date	due to MCR Fri 22/5
Critical date reason (if applicable)	
Context/Background information for clearance	
Additional Comments. Next steps, after EGM	progress QONs 1098 to MCR

clearance	
-----------	--

Thank you
Ell

From: Nakkan, John <John.Nakkan@act.gov.au>
Sent: Tuesday, 19 May 2026 4:35 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>; Gurnley, Clair <Clair.Gurnley@act.gov.au>
Subject: RE: FOR CLEARANCE: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 [REDACTED]

OFFICIAL

Hi Ell,

Both QON 1098 [REDACTED] are cleared from AMD Branch.

Thanks Clair and Ben for drafting.

Regards,

John Nakkan | Executive Branch Manager
Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
Asset Management and Delivery | Education | ACT Government
Level 4, 220 London Circuit | GPO Box 158 Canberra ACT 2601
Ngunnawal Country
www.education.act.gov.au | Facebook | Twitter | Instagram | LinkedIn

From: Do, Patrick <Patrick.Do@act.gov.au> On Behalf Of EDU, Cabinet & Assembly
Sent: Monday, 11 May 2026 4:46 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Nakkan, John <John.Nakkan@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>; Burn, Emma <Emma.Burn@act.gov.au>; EDU, Cabinet & Assembly <EDUCabinetAssembly@act.gov.au>
Subject: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 [REDACTED]

OFFICIAL

Good afternoon,

Please see below for action.

ASSEMBLY Question on Notice Response Request	
TRIM Number	FOL26/125
Branch and Title	AMD QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD
Action(s)	1. Prepare QON response (template in TRIM) 2. Complete QON costing tool (template in TRIM) Please liaise with other BUs as required.
Response type	Question on Notice (QON)
Clearance level required	EGM
Date due to EDUCabinetAssembly@act.gov.au	22 May 2026
Date Due to MO	22 May 2026
Further information	Please be reminded of the following: - QON responses should be concise and directly relevant to the subject matter of the question; - If relevant data is not readily available, or the Directorate does not centrally collect the information being requested, please let EDUCabinetAssembly@act.gov.au know as soon as possible – do not try and create data. - There is the option for Directorates to decline to answer the questions based on it being an unreasonable diversion of resources.
Comment	- Please contact EDUCabinetAssembly@act.gov.au if you have any questions. - QON paper in TRIM for your reference.

Kind regards

Patrick Do | A/g Assistant Director - Ministerial, Assembly and Cabinet
Phone: via MS Teams | Email: EDUCabinetAssembly@act.gov.au or patrick.do@act.gov.au
Ministerial & Corporate Reporting – Communication, Engagement and Government Service Branch | Education Directorate | ACT Government
220 London Circuit, Canberra City, ACT 2601 | GPO Box 158 Canberra ACT 2601

From: Stewart, Ell on behalf of EDU, EBM AMD
To: Player, Ben; Nakkan, John; EDU, EBM AMD
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098
Date: Friday, 22 May 2026 4:34:29 PM
Attachments: QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD.tr5
 image001.png

OFFICIAL

Thanks Ben, I've added your floor comment to the QON in trim

Ell

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Friday, 22 May 2026 4:15 PM
To: Nakkan, John <John.Nakkan@act.gov.au>; EDU, EBM AMD <EBM.AMD@act.gov.au>
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi John and Ell,

I'm waiting to hear back from EPA, I have been bounced around to a few different areas without an answer. Still chasing though!
 I did catch Robert a little later at HBCTL. He mentioned the transition between hard flooring and carpet may cause concerns with cleaning and wear and tear, given they butt up to each other. However looking at how it's been installed it meets EDIS requirements and isn't any different to the transition at other schools.

Regards

Ben Player
 Senior Director, Major Projects | Asset Management and Delivery
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 GPO Box 158 Canberra ACT 2601



We acknowledge the traditional custodians of the lands and waters where we live and learn, and pay our respects to elders past, present, and future.

From: Nakkan, John <John.Nakkan@act.gov.au>
Sent: Friday, 22 May 2026 3:21 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: Player, Ben <Ben.Player@act.gov.au>
Subject: RE: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell,

In reviewing Nessa's comments, we are going to have to check with Access Canberra about the LMWQCC reporting (Question 5). We will also need to recheck with School Cleaning Services for Question 6. Robert Foote mentioned something about floor transitions in our lessons learned workshop yesterday but we didn't get the opportunity to follow up with him about this we ran over time and had to go to other commitments.

I have responded to the other comments.

Regards,

John Nakkan | Executive Branch Manager
 Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
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 Level 4, 220 London Circuit | GPO Box 158 Canberra ACT 2601
 Ngunnawal Country
www.education.act.gov.au | [Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

From: Stewart, Ell <Ell.Stewart@act.gov.au> **On Behalf Of** EDU, EBM AMD
Sent: Friday, 22 May 2026 1:42 PM
To: Nakkan, John <John.Nakkan@act.gov.au>
Cc: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>
Subject: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi John, re EGM comments in attached Strathnairn QON (air quality) -

- I already emailed P&P and WH&S on 14/5 – they had nil input
- I spoke to Complaints team this am – nil input
- School Ops said check with the school – as stated in the QON no complaints have been received by EDU about air quality in facilities delivered through Stage 1 of the School, and noting the relationship AMD has built with the school any concerns with the issues in the QON would immediately be notified to AMD. The only issues were some concerns with temperatures within administration spaces with the seasonal transition
- Ben spoke to SCS who said nil input

- We have not had a response since asking yesterday about the EPA monthly performance results. For your advice please what do u want to respond on that one John?

Please advise if we can progress back to IDSO (who are chasing this) If you are satisfied with that level of investigation? For return to EGM as soon as possible

Thank you
Ell

From: Player, Ben <Ben.Player@act.gov.au>
Sent: Wednesday, 20 May 2026 5:33 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: Nakkan, John <John.Nakkan@act.gov.au>
Subject: RE: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell,

I can check with P&P/School Ops/Complaints and SCS, noting the relationship with have built with the school that if there were any concerns with the issues in the QON we would be the first to know. I can see if I still have a contact with for the water quality plant from when we did the planning and monitoring as part of the estate development.

Regards

Ben Player
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 GPO Box 158 Canberra ACT 2601



We acknowledge the traditional custodians of the lands and waters where we live and learn, and pay our respects to elders past, present, and future.

From: Stewart, Ell <Ell.Stewart@act.gov.au> On Behalf Of EDU, EBM AMD
Sent: Wednesday, 20 May 2026 4:27 PM
To: Player, Ben <Ben.Player@act.gov.au>
Cc: Nakkan, John <John.Nakkan@act.gov.au>; EDU, EBM AMD <EBM.AMD@act.gov.au>
Subject: FW: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ben

Please review EGM comments in the QON 1098 - I think I can check the comments with P&P/School ops/Complaints and SCS. Can you please check about the Access Canberra comment? Or let me know if you want to do it differently – we need to return by COB tomorrow

Thank you
Ell

From: EDU, EGMIDS <EGMIDS@act.gov.au>
Sent: Wednesday, 20 May 2026 4:13 PM
To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>
Subject: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Ell

Nessa has reviewed and left some comments to be addressed to QON 1098. If you are able to return by COB tomorrow please.

Thanks

Jess

From: Stewart, Ell On Behalf Of EDU, EBM AMD
Sent: Tuesday, 19 May 2026 4:39 PM
To: EDU, EGMIDS
Cc: EDU, EBM AMD
Subject: FOR CLEARANCE: FOR ACTION: FOL26/125 - QONs 1098

OFFICIAL

Good afternoon

Clearance Advice	
Title	QON 1098
TRIM No	FOL26/125

TRIM admin	- Action tree updated (if there is one) Y - Comment added in Notes Y - Documents all checked-in – Y
EBM Approved	yes – AMD 19/5
Any other ESO engagement	
Clearance due date/Critical Date	due to MCR Fri 22/5
Critical date reason (if applicable)	
Context/Background information for clearance	
Additional Comments. Next steps, after EGM clearance	progress QONs 1098 to MCR

Thank you
Ell

From: Nakkan, John <John.Nakkan@act.gov.au>

Sent: Tuesday, 19 May 2026 4:35 PM

To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>; Gumley, Clair <Clair.Gumley@act.gov.au>

Subject: RE: FOR CLEARANCE: FOR ACTION: FOL26/125 - QON 1098

OFFICIAL

Hi Ell,

Both QON 1098 are cleared from AMD Branch.

Thanks Clair and Ben for drafting.

Regards,

John Nakkan | Executive Branch Manager
Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
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From: Do, Patrick <Patrick.Do@act.gov.au> On Behalf Of EDU, Cabinet & Assembly

Sent: Monday, 11 May 2026 4:46 PM

To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Nakkan, John <John.Nakkan@act.gov.au>

Cc: EDU, EGMIDS <EGMIDS@act.gov.au>; Burn, Emma <Emma.Burn@act.gov.au>; EDU, Cabinet & Assembly <EDUCabinetAssembly@act.gov.au>

Subject: FOR ACTION: FOL26/125 - QON 1098

OFFICIAL

Good afternoon,

Please see below for action.

ASSEMBLY Question on Notice Response Request	
TRIM Number	FOL26/125
Branch and Title	AMD QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD
Action(s)	1. Prepare QON response (template in TRIM) 2. Complete QON costing tool (template in TRIM) Please liaise with other BUs as required.
Response type	Question on Notice (QON)
Clearance level required	EGM
Date due to EDUCabinetAssembly@act.gov.au	22 May 2026
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Comment	- Please contact EDUCabinetAssembly@act.gov.au if you have any questions. - QON paper in TRIM for your reference.

Kind regards

Patrick Do | A/g Assistant Director - Ministerial, Assembly and Cabinet

Phone: via MS Teams | Email: EDUCabinetAssembly@act.gov.au or patrick.do@act.gov.au

Ministerial & Corporate Reporting – Communication, Engagement and Government Service Branch | Education Directorate | ACT Government

From: [Nakkan, John](#)
To: [EDU, EGMIDS](#); [EDU, EBM AMD](#)
Cc: [Player, Ben](#)
Subject: FW: FOR CLEARANCE ASAP: FOR AMENDMENT: FOL26/125 - QON 1098
Date: Friday, 22 May 2026 5:14:03 PM
Attachments: [QON 1098 - Barry MIA - Schools \(Strathnairn School - Environmental Safety\) - AMD.tr5](#)
Importance: High

OFFICIAL

Hi all,

Updated and cleared from AMD Branch.

Regards,

John Nakkan | Executive Branch Manager
 Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkan@act.gov.au
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To: EDU, EBM AMD <EBM.AMD@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>
Subject: FOR AMENDMENT: FOL26/125 - QON 1098

OFFICIAL

Hi Eli

Nessa has reviewed and left some comments to be addressed to QON 1098. If you are able to return by COB tomorrow please.

Thanks

Jess

From: Stewart, Eli On Behalf Of EDU, EBM AMD
Sent: Tuesday, 19 May 2026 4:39 PM
To: EDU, EGMIDS
Cc: EDU, EBM AMD
Subject: FOR CLEARANCE: FOR ACTION: FOL26/125 - QONs 1098 [REDACTED]

OFFICIAL

Good afternoon

Clearance Advice	
Title	QON 1098 [REDACTED]
TRIM No	FOL26/125
TRIM admin	- Action tree updated (if there is one) Y - Comment added in Notes Y - Documents all checked-in – Y
EBM Approved	yes – AMD 19/5
Any other ESO engagement	
Clearance due date/Critical Date	due to MCR Fri 22/5
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Thank you
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To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Player, Ben <Ben.Player@act.gov.au>; Gumley, Clair <Clair.Gumley@act.gov.au>
Subject: RE: FOR CLEARANCE: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 [REDACTED]

OFFICIAL

Hi Eli,

Both QON 1098 [REDACTED] are cleared from AMD Branch.

Thanks Clair and Ben for drafting.

Regards,

John Nakkari | Executive Branch Manager
 Phone: +61 2 6205 1289 | Mobile: 0466 015 922 | Email: john.nakkari@act.gov.au
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To: EDU, EBM AMD <EBM.AMD@act.gov.au>; Nakkari, John <John.Nakkari@act.gov.au>
Cc: EDU, EGMIDS <EGMIDS@act.gov.au>; Burn, Emma <Emma.Burn@act.gov.au>; EDU, Cabinet & Assembly <EDUCabinetAssembly@act.gov.au>
Subject: FOR ACTION: FOL26/125 - QON [REDACTED] 1098 [REDACTED]

OFFICIAL

Good afternoon,

Please see below for action.

ASSEMBLY Question on Notice Response Request	
TRIM Number	FOL26/125
Branch and Title	AMD
	QON 1098 - Barry MLA - Schools (Strathnairn School - Environmental Safety) - AMD
Action[s]	1. Prepare QON response (template in TRIM) 2. Complete QON costing tool (template in TRIM) Please liaise with other BUs as required.
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	EDUCabinetAssembly@act.gov.au
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