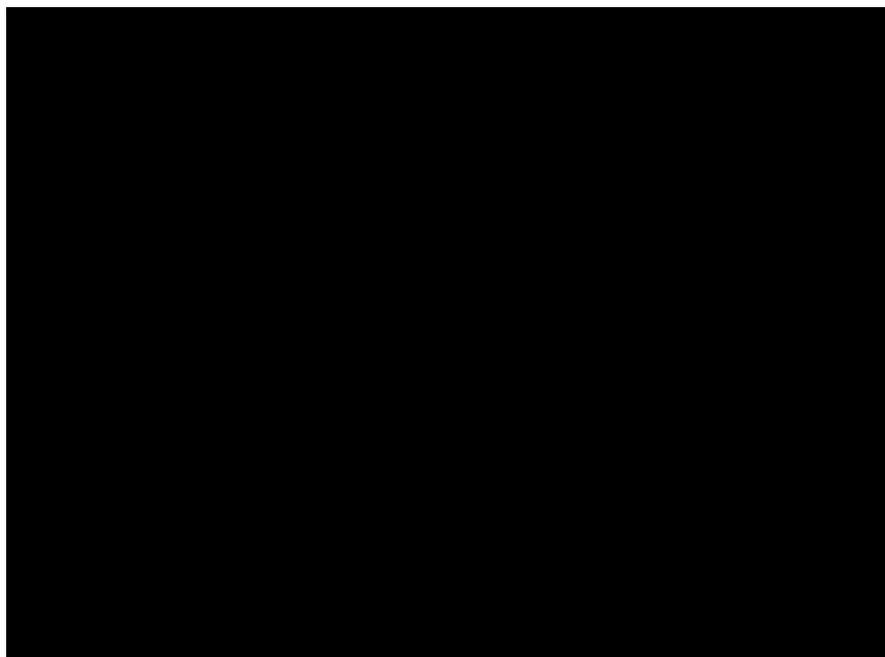




## Volume 2 Output Specification

### Part A: Functional Brief

#### New P-6 School



## ACT Education Directorate

### 2016

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<b>Volume</b>	<b>Description</b>
<b>Volume 1</b>	<b>Project Overview &amp; General Requirements</b>
	Part A – General Information & Instructions to Respondents
	Part B – Proposal Requirements
	Part B – Appendices
<b>Volume 2</b>	<b>Output Specification</b>
	Glossary
	<b>Part A – Functional Brief</b>
	Part B – Masterplanning and Architectural Specification
	Part C – Technical Specification
	Part D – Furniture, Fittings and Equipment Specification
	Part E – Project Specific Information
<b>Volume 3</b>	<b>Contractual Documents</b>
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# 1 Introduction

A detailed overview of the Project, and its requirements, is provided in Volume 1 – Project Overview and General Requirements of the Request for Proposal (RFP) and should be referred to as needed to provide context and background to the various parts of this volume, Volume 2 – Output Specification.

## 1.1 Structure of Volume 2: Output Specification

The Output Specification is structured as shown in Table 1.

**Table 1: Output Specification structure**

Part	Heading	Contents
A	Functional Brief	Outlines the Education Vision, Values and Priorities and key education principles of the Education Directorate (the Directorate) and their implications for facilities design. Broad functional requirements, functional relationships and specific functional requirements are described for the particular school type: Preschool–Year 6.
B	Master-planning and Architectural Specification	Details the masterplanning requirements and architectural design principles. Provides details of the minimum requirements for landscape and traffic design. Also provides site specific information.
C	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.
D	Furniture, Fittings and Equipment Specification	Details the FF&E requirements for the Project.

## Volume 2: Part A — Functional Brief

The Functional Brief:

- presents the educational vision, values, mission and priorities of the Directorate;
- outlines the Education Principles derived from the vision and values;
- lists Education Facilities Design Principles to guide facilities design; and
- details the functional requirements for the school; and
- provides site specific information.

## 1.2 Guiding principles

Throughout the Output Specification various sets of ‘principles’ are referred to:

- **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 and engagement with community — Section 3.1, *Volume 2 Part A*.
- **Education Facilities Design Principles** capture the implications of the education principles for the design of facilities — Section 3.2, *Volume 2 Part A, Table 5*
- **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<sup>1</sup>.
- **Architectural, Urban Planning and Masterplanning Principles** — *Volume 2 Part B*.

<sup>1</sup> <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/> viewed 20 October 2014

## 2 ACT Government vision, values, priorities and goals

### 2.1 Strategic priorities

The ACT Government Strategic Priorities focus on:

- Economic growth and diversification;
- Enhancing liveability and social inclusion;
- Suburban renewal and better transport; and
- Health and education investment.

The mandate for the design of schools, and thus this Functional Brief, can be found in the support documents that translate this strategic intent into strategic plans. For example, the vision of the supporting document the Canberra Social Plan 2011<sup>2</sup>, is stated as:

“Canberra is a place where all people reach their potential, make a contribution and share the benefits of an inclusive community.

... New schools, quality teaching, smaller class sizes and improved learning facilities have positioned Canberra as the education capital of Australia. For our children and young people, it means a better future with the skills and optimism to make the most of their opportunities”. *Canberra Social Plan 2011*, p5 and Foreword.

The ACT Government Infrastructure Plan 2011–2021<sup>3</sup> captures the implications of The Canberra Plan for the design and development of education facilities. These priorities, shown in Table 2, are key drivers for the development of a Functional Brief that sets out Directorate guidelines for creating schools that provide contemporary learning and teaching environments and the next generation of teaching and learning online.

**Table 2: Infrastructure Plan 2011–2021 Priorities (pertinent items highlighted)**

POLICY PRIORITIES	STRATEGIC INFRASTRUCTURE PRIORITIES
<ul style="list-style-type: none"> <li>• Implementing an integrated and comprehensive approach to school improvement.</li> <li>• Improving the transition for children from home to early childhood settings, and to school.</li> <li>• Increasing high school and college retention rates.</li> <li>• Undertaking high school and college sector reform and renewal.</li> <li>• Better integrating and coordinating secondary education and vocational training.</li> <li>• Improving teacher quality in ACT schools.</li> <li>• <b>Creating schools that provide 21st century learning and teaching environments.</b></li> <li>• <b>Developing the next generation of teaching and learning online, including through the delivery of a new Virtual Learning environment.</b></li> <li>• <b>Reducing greenhouse gas emissions and enhancing sustainability in schools.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Developing quality school facilities to meet the needs of a growing city.</b></li> <li>• Targeting investment to meet need in areas of geographic priority.</li> <li>• <b>Building 21st century learning and teaching environments.</b></li> <li>• Providing capacity to meet demand for and improve the transition from home to early childhood settings and to early school years.</li> <li>• Developing an integrated management system for school staffing.</li> <li>• <b>Creating and maintaining a safe and inclusive student learning environment.</b></li> <li>• <b>Reducing greenhouse gas emissions from ACT Public Schools.</b></li> </ul>

### 2.2 ACT Public Service Values

In addition to the Canberra Plan and its support documents and plans, the Functional Brief takes its lead from the four foundation ACT Public Service (ACTPS) values.

- Respect.
- Integrity.

<sup>2</sup> ACT Government, 2011 *Canberra Social Plan*, <http://www.cmd.act.gov.au/policystrategic/socialplan>

<sup>3</sup> ACT Government, 2011 *ACT Government Infrastructure Plan 2011–2021*, <http://www.cmd.act.gov.au/policystrategic/infrastructure>

- Collaboration.
- Innovation.

The Output Specifications in general, embrace the value of innovation and were developed in response to “asking ‘but why’, actively seeking out new and better ways of doing what we do (as well as better things to do), and not settling for how it has always been.”<sup>4</sup>

### 3 ACT Education Directorate’s - Education Framework

The Directorate’s Education Framework includes:

- vision and values;
- priorities and goals;
- educative purpose;
- education principles;
- curriculum; and
- pedagogical approach.

#### 3.1 The Directorate’s vision and values

In playing its part in developing Canberra as a knowledge-based community, the Directorate states:

...“our vision is to see that all young people in the ACT learn, thrive and are equipped with the skills to lead fulfilling, productive and responsible lives”.<sup>5</sup>

“The Directorate takes pride in having values that are aligned with the ACT Public Service values and behaviours. These values and behaviours underpin our service delivery to the community:

**Respect:** We take pride in our work and value the contribution of others.

**Integrity:** We take responsibility for our decisions and actions.

**Collaboration:** We work openly, seek out the views of others and welcome feedback.

**Innovation:** We seek to continuously improve our services and are open to change and new ideas”.<sup>6</sup>

The Directorate’s work is strengthened through building partnerships with students, their families and the community more broadly.

#### 3.2 Priorities and goals

The Directorate’s priorities are described in Strategic Plan 2014–2017: Education Capital – Leading the Nation.

**Quality Learning:** We will ensure all students have access to powerful and relevant learning experiences.

**Inspirational Teaching and Leadership:** We will build the capacities of our teachers and leaders - by design, not by chance.

**High Expectations, High Performance:** We have high expectations for all and will meet the learning needs of every student.

**Connecting with Families and the Community:** We will partner with families and engage with the community to build meaningful relationships.

**Business Innovation and Improvement:** We will support innovation, improve our business systems and be open and accountable for our decisions.

<sup>4</sup> ACTPS Values and Signature Behaviours, <http://www.jobs.act.gov.au/about-the-actps/managers-toolkit/values-and-behaviour> viewed July 2015

<sup>5</sup> ACT Education Directorate, Annual Report 2009–2010 [http://www.det.act.gov.au/publications\\_and\\_policies/publications\\_a-z/annual\\_report/Annual\\_Report\\_2009-2010/section\\_a/the\\_organisation](http://www.det.act.gov.au/publications_and_policies/publications_a-z/annual_report/Annual_Report_2009-2010/section_a/the_organisation) viewed June 2015

<sup>6</sup> ACT Education Directorate, Annual Report 2012–2013 [http://www.det.act.gov.au/publications\\_and\\_policies/publications\\_a-z/annual\\_report/annual-report-2013-2014/Section-B/b1-organisational-overview](http://www.det.act.gov.au/publications_and_policies/publications_a-z/annual_report/annual-report-2013-2014/Section-B/b1-organisational-overview) viewed June 2015

### 3.3 Educative purpose

#### The Melbourne Declaration of Educational Goals for Young Australians

All States and Territories in Australia take the direction for their educative purpose from The Melbourne Declaration of Educational Goals for Young Australians (MCEETYA, 2008)<sup>7</sup>. It declares the value of:

“the central role of education in building a democratic, equitable and just society—a society that is prosperous, cohesive and culturally diverse, and that values Australia’s Indigenous cultures as a key part of the nation’s history, present and future”. (MCEETYA, 2008 p4)

The Declaration identifies two main goals to achieve this purpose:

**Goal 1:** Australian schooling promotes equity and excellence.

**Goal 2:** All young Australians become:

- successful students;
- confident and creative individuals; and
- active and informed citizens.

Achieving these educational goals is the collective responsibility of governments, school sectors and individual schools as well as parents and carers, young Australians, families, other Education providers, business and the broader community. (MCEETYA, 2008 p8)

The Melbourne Declaration acknowledges the significant changes in the world since the Adelaide Declaration in 1999 and, in addition to identifying literacy, numeracy and knowledge in the key disciplines (Learning Areas) as essential, the Melbourne Declaration identifies that successful students develop their capacity to be lifelong learners who:

- play an active part in their own learning;
- are effective collaborators and team workers;
- are creative, innovative and resourceful;
- are able to make sense of their world; and
- are self motivated, self managing and self-directed.

It also emphasises the development of young people as responsible local and global citizens who understand, appreciate and acknowledge cultural diversity.

### 3.4 The Canberra Public School System

Canberra public schools are community oriented with school-based development of curriculum aligned to the outcomes and achievement standards of the Australian Curriculum, school based assessment and School Board participation in the selection of principals. The community extensively uses Canberra public schools both during and out of school hours.

#### Public School types

Currently the ACT education system has varying structures, which include:

- Preschools (public);
- 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);
- Colleges year 11 to year 12 (11-12); and
- Specialist Schools and Education Centres provide a range of programs including outdoor education, instrumental music, a hospital school and specialised support for students with disability.

#### Inclusive Schools

Canberra public schools provide equitable, high quality education for each and every student. The principles of ‘equity, universality and non-discrimination’ are paramount in providing an inclusive learning environment for each student with a disability (*Education Act 2004*). The Directorate is committed to establishing and maintaining a

<sup>7</sup> MCEETYA, 2008 The Melbourne Declaration of Educational Goals for Young Australians, [http://www.mceecdya.edu.au/mceecdya/melbourne\\_declaration,25979.html](http://www.mceecdya.edu.au/mceecdya/melbourne_declaration,25979.html)

supportive school environment for students with disability and to promoting positive attitudes towards students with disability within the school community. In addition to providing learning support within all schools, specialist schools also provide educational programs for students with disability to enable a continuum of education options for families.

#### Approach to education of students with disability within mainstream schools:

"the Directorate fully supports the enrolment of students with a disability in mainstream school settings" and has a "commitment to an inclusive education system that provides high quality learning opportunities and positive educational outcomes for every student enrolled in a Canberra Public school." ACT Education Directorate Students with Disability: meeting their educational needs 2008<sup>8</sup>

The key principle underpinning inclusive education is the removal of whatever excludes or marginalises—inclusive design means providing the environment that promotes and enables inclusion. Although often used as a term in relation to education of students with a disability, inclusive education applies to all students. The strong movement towards personalised learning and individual education plans in all schools signifies the widespread movement towards inclusive education.

The advantage of integrating support for students with disability within primary and secondary schools is that it facilitates the provision of a flexible continuum of educational provision. The degree of inclusion for each student can be determined according to need, ability and assessed benefit. It enables a customised approach to inclusion rather than a 'one size fits all' approach. Furthermore, there is potential for a greater number of students to benefit from the expertise of staff. Collaboration between teachers with different expertise can provide greater support for all students in the school. The opportunities that arise from integration have an enriching effect for all students and staff.

The international evidence indicates that good practice in inclusive education involves consideration of a range of aspects. ... At a whole, school level good practices include adjustments to cultures, policies, and practices, development of support structures, regimes of funding support, and the provision of and access to equitable learning opportunities. At an in-class level, differentiating curricula or introducing alternative curricula, the application of universal design, use of information technologies, individual planning through the individual education plan (IEP), and a focus on quality teaching for all students are the most prominent practices.<sup>9</sup>

To maximise opportunities for students with disability to succeed, school policy and practice should reflect:

- collaboration between teachers and students, parents, guardians or carers, education and health professionals to develop criteria for agreed understanding and responses to a student's behaviour, communication skills and learning needs;
- curriculum-based learning plans developed by a student support group that set out the student's learning goals;
- teaching and learning strategies that take account of the student's background, experiences and individual goals;
- opportunities for the student to develop knowledge, skills and behaviour and functional life skills in a range of Learning Areas and contexts; and
- opportunities for all students to participate in learning activities with other students.

The design of facilities and functional units to support students with disability in all sections of ACT P-6 and P-10 schools are outlined in the Functional Specifications section of the Functional Brief.

## The Australian Curriculum

The Australian Curriculum defines what students are entitled to learn in Foundation<sup>10</sup>/Kindergarten to Year 10 (K-10) in order to achieve the two goals of the Melbourne Declaration.

### Key components of the Australian Curriculum

As expected in a rapidly changing, highly technological, globalised, post-industrial world, the Australian Curriculum has introduced new elements to the curriculum and places greater emphasis on emerging technologies and emerging capabilities. In addition to digital media and design with technology, the Australian Curriculum brings a stronger focus to Languages from the early years, the development of General Capabilities from Kindergarten to Year 10 and Cross Curriculum Priorities. The key components of the Australian Curriculum are outlined in Table 3.

<sup>8</sup> ACT Government Education, 2008 [Students with a Disability: Meeting their Educational Needs](#)

<sup>9</sup> Australian Research Alliance for Children and Youth (2013) *Inclusive education for students with disabilities. A review of the best evidence in relation to theory and practice* [http://Appendix B.aracy.org.au/publicationsresources/command/download\\_file/id/246/filename/Inclusive\\_education\\_for\\_students\\_with\\_disability\\_-\\_A\\_review\\_of\\_the\\_best\\_evidence\\_in\\_relation\\_to\\_theory\\_and\\_practice.pdf](http://Appendix B.aracy.org.au/publicationsresources/command/download_file/id/246/filename/Inclusive_education_for_students_with_disability_-_A_review_of_the_best_evidence_in_relation_to_theory_and_practice.pdf)

<sup>10</sup> 'Foundation' is a term agreed upon by all State and Territory Ministers to provide an Australia-wide consistent name for the first year of school. 'Foundation' replaces 'Kindergarten' in NSW and the ACT, 'Prep' in Vic and 'Reception' in SA.

## Implementation of the Australian Curriculum in Canberra Public Schools

The Directorate has chosen to implement the Australian Curriculum as developed by the Australian Curriculum Assessment and Reporting Authority (ACARA). The Australian Curriculum was not revolutionary for the ACT. In many ways, the Australian Curriculum was a recasting of much of what the Directorate had identified, in Every Chance to Learn, as essential learning for young people who will live their lives predominantly in the 21st Century. The newly defined ACT P–10 curriculum presented in Every Chance to Learn was developed to achieve a very similar educative purpose as was later defined in the Melbourne Declaration. Every Chance to Learn defined the goal of education was to develop each student as a student, person, community member and contributor to society. In addition to defining essential learning in the Learning Areas, Every Chance to Learn identified a number of Essential Learning Achievements which are very similar to the General Capabilities that were later included in the Australian Curriculum. In 2015 ACT Schools are required to fully implement the Australian Curriculum.<sup>11</sup>

**Table 3: Overview of the Australian Curriculum K–10**

Learning Areas and Subjects	Year levels	General Capabilities important for life and work in the 21st century	Cross Curriculum Priorities
The Arts <ul style="list-style-type: none"> <li>• Music</li> <li>• Visual Arts</li> <li>• Dance</li> <li>• Drama</li> <li>• Media Arts</li> </ul>	K–10	Integrated across all Learning Areas and all Year levels <ul style="list-style-type: none"> <li>• Literacy</li> <li>• Numeracy</li> <li>• ICT Capability</li> <li>• Critical and Creative Thinking</li> <li>• Personal and Social Capability</li> <li>• Ethical Behaviour</li> <li>• Intercultural Understanding</li> </ul>	Integrated across all Learning Areas and all Year levels <ul style="list-style-type: none"> <li>• Aboriginal and Torres Strait Islander histories and cultures</li> <li>• Asia and Australia’s engagement with Asia</li> <li>• Sustainability</li> </ul>
English	K–10		
Mathematics	K–10		
Health and Physical Education	K–10		
Humanities and Social Sciences <ul style="list-style-type: none"> <li>• History</li> <li>• Geography</li> <li>• Civics and Citizenship</li> <li>• Economics and Business</li> </ul>	K–10 K–10 Yrs 3–10 Yrs 5–10		
Languages	K–10		
Science	K–10		
Technologies <ul style="list-style-type: none"> <li>• Design and Technologies</li> <li>• Digital Technologies</li> </ul>	K–10		
Work Studies (optional)	Yrs 9–10		

### 3.5 The ACT Education Directorate’s position on pedagogy

#### Approach to learning in Preschool

Learning commences prior to birth and families are a child's first educators. Due to the critical nature of a child's brain development in the first three or four years of life, the learning that takes place within families, communities and the formal arrangements of child care and Preschool is of the utmost importance.

<sup>11</sup> ACT ED (2015) *Australian Curriculum Implementation Schedule for ACT Schools*, [http://www.det.act.gov.au/\\_data/assets/pdf\\_file/0019/592210/2015-Australian-Curriculum-Implementation-Schedule-for-ACT-Schools-14-04-2015.pdf](http://www.det.act.gov.au/_data/assets/pdf_file/0019/592210/2015-Australian-Curriculum-Implementation-Schedule-for-ACT-Schools-14-04-2015.pdf) viewed April 2015

Preschools ensure continuity in curriculum and relationships in a child's early years.

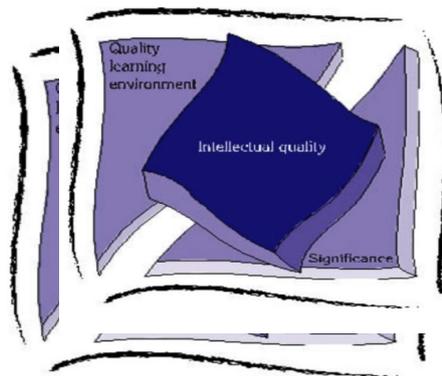
The pedagogy and curriculum of ACT Preschools aligns with the Australian Early Years Learning Framework Being, Becoming and Belonging [See section 6.2.2].

### Approach to learning and teaching in K–12

Since the early 2000's the ACT has chosen to frame their pedagogy statement in terms of the three key features of pedagogy identified by the NSW DET Quality Teaching Framework:<sup>12</sup>

- intellectual quality;
- a quality learning environment; and
- significance.

**Figure 1: NSW Quality Teaching Framework**



**Intellectual quality** refers to pedagogy focused on producing deep understanding of important, substantive concepts, skills and ideas. Such pedagogy treats knowledge as something that requires active construction and students to engage in higher-order thinking and to communicate substantively about what they are learning.

**Quality learning environment** refers to pedagogy that creates conditions where students and teachers work productively in an environment clearly focused on learning. Such pedagogy sets high and explicit expectations and develops positive relationships between teachers and students and among students.

**Significance** refers to pedagogy that helps make learning meaningful and important to students. Such pedagogy draws clear connections with students' prior knowledge and identities, with contexts outside of the classroom and with multiple ways of knowing and cultural perspectives. Source: *Every Chance to Learn*, p20.

Central to the Directorate achieving its vision of all young people in the ACT learning, thriving and being equipped with the skills to lead fulfilling, productive and responsible lives, is alignment of each school's focus on the needs of students and empowering all students to learn and achieve personal success regardless of their individual circumstances.

Personal success in learning involves developing a positive disposition to learning and the holistic development of self—aesthetic, intellectual, emotional, social, spiritual and physical. Health and wellbeing, developing a sense of community and belonging, inclusion of all students and honouring and celebrating diversity are vital to a strong society.

Knowledge and understanding of themselves and their world, combined with developing General Capabilities, will ensure young people are equipped to participate and contribute meaningfully in society—a society facing the complexity, uncertainty and challenges that continue to emerge in a highly connected, globalised, technological world.

The Directorate's vision for learning aligns with the Melbourne Declaration (2008) which identifies that successful students develop their capacity to be lifelong learners who:

- play an active part in their own learning;
- are effective collaborators and team workers;

<sup>12</sup> NSW DEC (2003) Quality Teaching in NSW Schools, [https://www.det.nsw.edu.au/proflearn/docs/pdf/qt\\_EPSColor.pdf](https://www.det.nsw.edu.au/proflearn/docs/pdf/qt_EPSColor.pdf)

- are creative, innovative and resourceful;
- are able to make sense of their world; and
- are self motivated, self managing and self-directed.

This vision, in turn aligns with global trends in learning in the 21st century.

### 3.6 21<sup>st</sup> century, contemporary learning

It is considered highly probable<sup>13</sup> that learning will continue to evolve according to themes that are already evident:

- approaches to learning and teaching that recognise the holistic, personal and social nature of learning;
- that we learn through every aspect of our lives;
- greater integration of school with community;
- increasing global and virtual connectedness;
- greater accessibility to learning anytime, anywhere and anyhow;
- learning through the lifespan and across ages;
- learning extending outside of traditional hours; and
- increasing opportunities for learning through virtual experience.

#### The evolution of contemporary learning

There are two driving forces for contemporary learning and contemporary pedagogy:

- research in the learning sciences that has been accumulating since the 1970s<sup>14</sup>; and
- the demands of the contemporary world and the capabilities required to operate successfully in this world.

The learning sciences research is multi-disciplinary research—cognitive psychology, social psychology, education and neuroscience. The outcomes of these various research fields are extremely consistent. Human learning is at its most powerful, when it is:

- **intrinsically motivated and lifelong:** student driven learning is transformative and generative;
- **personal:** making personal meaning and building personal capacity in a safe, supportive but challenging environment;
- **relational:** gaining support and inspiration from learning in relation to others, deriving a sense of challenge and expectation from significant others;
- **holistic and experiential:** the whole person learns through participating in authentic, purposeful, experiential activities; and
- **complex and non-linear:** holistic growth through active engagement and integration rather than simply accretion or accumulation of layers.<sup>15</sup>

Despite the compelling nature of the learning sciences research, these research findings alone were not powerful enough to overcome the habits and methods of centuries of schooling. It was not until society and governments started to understand and face the demands and challenges of the contemporary world that widespread impetus emerged to truly transform the nature of school learning.

In response to the greater understanding of learning emerging from the learning sciences the OECD Centre for Education Research and Innovation (CERI) developed a set of seven principles to support learning.

- Make learning and student engagement central.
- Ensure that learning is social and often collaborative.
- Be highly attuned to students' motivations and emotions.
- Be acutely sensitive to individual differences including in prior knowledge.
- Be demanding for each student but without excessive overload.
- Assessment is critical, but must underpin learning aims & strong emphasis on formative feedback.
- Promote connectedness across areas of knowledge as well as to the community and the wider world.

<sup>13</sup> OECD (2011) Compendium of Exemplary Education Facilities *Transforming Spaces for Learning*.

<sup>14</sup> Sawyer, R. K. (Ed.). (2014). *The Cambridge Handbook of the Learning Sciences* (2 edition). New York, NY: Cambridge University Press.

<sup>15</sup> *ibid*

## Contemporary education research

Research on what contributes to academic achievement<sup>16</sup> shows that 50% of the variance in academic achievement is due to the students themselves with 30% of the variance attributed to the teacher. Before the late 1990s it was assumed by many, if not most, educators that the 50% of variance in academic achievement due to the students was beyond the control of teachers since the general belief at that time was that intelligence was fixed. Neuroscience and the application of neuroscience findings to teaching and learning have refuted this assumption about intelligence. Neuroscience shows that the brain is 'plastic'; that it responds to, adapts to and is shaped by experience. Multiple research studies<sup>17</sup> show that academic achievement is raised when students:

- are helped to develop an understanding that intelligence is not fixed;
- are taught that they can become more intelligent by learning strategies for learning and thinking; and
- are encouraged to be persistent and determined in their approach to learning.

The heartening consequence of these findings is that developing the very capabilities that are required for success in 21st century life has a positive, compounding effect on academic success. Powerful learning involves developing powerful students.

## Contemporary pedagogy

Contemporary pedagogy has developed in response to our increased understanding of the nature of human learning and the pressing demands on the 21st century world. The globalised, post-industrialised world poses a challenge for educators to:

“... prepare young people for uncertainty and changes that are yet to come, to prepare young people for a society that is in a state of rapid transformation. 21st century education is increasingly driven by a desire to develop young people who are adaptable, creative, collaborative, responsive, self directed and capable of being self managing in networks and less hierarchical settings and communities than experienced by their parents at the same age.” (Atkin, 2011)<sup>18</sup>

This challenge demands that, in addition to working towards traditional academic measures of success, schools today are charged with the responsibility of helping students learn how to learn, think and problem solve in unpredictable contexts. This is clearly articulated in the Melbourne Declaration on Educational Goals for Young Australians.

It is widely acknowledged<sup>19,20</sup> that 'learning about' skills and capabilities does not develop capabilities and skills. Capabilities and skills are not developed by transmission of information. Collaborative ways of working and independence, for example, are developed through participatory and experiential processes where students learn to be collaborative, self-directed and self-managing. Developing global citizens involves more than projects to raise money for giving aid to developing communities. Global awareness and global education means being connected seamlessly to other young people around the globe and engaging together in youth dialogue and projects that transcend geographical and cultural boundaries.

Contemporary pedagogy is therefore characterised by an emphasis on personalisation, active investigation and inquiry, collaboration and growth towards self-management and self-direction within a supportive learning environment.

The teacher's role in the 21st century-learning context is to mediate, skillfully, the multiple learning and teaching modes available in response to the learning needs and aspirations of the student and the desired learning outcomes. This means moving between a repertoire of strategies that range from the traditional didactic mode of direct explicit instruction to facilitation of inquiry, self-expression and problem solving. Depending on the context, group sizes can range from individual to small, large and very large groups. Teacher collaboration is key to providing the flexibility and pooled resources required to be responsive to student's needs.

Teacher, peer and self-assessment of learning are characteristic of contemporary pedagogy. Teachers observe students in authentic learning contexts and student progress is increasingly monitored, tracked and communicated in real time through online tools.

<sup>16</sup> Hattie J (2003) 'Teachers Make a Difference: What is the research evidence'  
[https://www.det.nsw.edu.au/proflearn/docs/pdf/qt\\_hattie.pdf](https://www.det.nsw.edu.au/proflearn/docs/pdf/qt_hattie.pdf) (accessed 15 July, 2014)

<sup>17</sup> See for example, Dweck C (2006) *Mindset: The new psychology of success* Ballantine Books, New York and Langer E (1989) *Mindfulness*, Perseus Books

<sup>18</sup> Atkin, J. *Transforming Spaces for Learning*, in *Designing for Education: Compendium of Exemplary Educational Facilities 2011* OECD CELE

<sup>19</sup> Dreyfus H.L and Dreyfus S.E *A Five Stage Model of the Mental Activities involved in Skill Acquisition* UC Berkeley, 1980  
<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA084551> accessed 27 July, 2013

<sup>20</sup> Carr, M. *Dimensions of Strength for the Key Competencies*  
<http://nzcurriculum.tki.org.nz/content/download/507/3828/file/dimensions-for-tki.doc> accessed 20 July, 2013

## Connected students

### Connecting with the community

The ACT Government has a long-standing commitment to building inclusive communities. In relation to education and schools, the Directorate sees building partnerships with community and connecting with families and the community as central to its vision. This vision extends beyond simply building meaningful and supportive relationships; it means connecting learning with the community beyond the confines of the classroom or school and requires facilities that bridge the gap between community and school.

Facilities must be designed with reference to the broader community context and foster joint use arrangements, sharing and community access for use outside school hours wherever possible. Parents and other community members should feel that they are welcomed and valued at the school and spaces must be available to display and celebrate student performances and work.

### Digital connectivity, digital learning

The Directorate's commitment to creating schools that provide 21st century learning and teaching environments and developing the next generation of teaching and learning online through its digital learning approach emphasises the power of technology, if used effectively and purposefully, to redefine how we learn and unlock the potential of all students.

Digital technologies enable learning by:

- providing access to quality online resources and experts;
- increasing the agency of the students by placing access to learning in their hands;
- supporting personalisation of learning;
- providing real-time assessment and reporting of learning;
- facilitating collaboration and connection; and
- enabling ease of sharing or children'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 being transformed once again as mobile devices (often BYOD - bring your own device), the capacity to beam wirelessly from individual devices to a variety of AV displays, virtual conferencing to connect locally and globally with and without high-end equipment, and even wearable technology enter the scene.

Mobility, agility and distributed access are key features required in equipping facilities for digital learning.

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 administration areas and general and specialist learning environments;
- Interactive Teaching Technology (ITT);
- AV display screens for small group collaboration, presentation and virtual conferencing;
- data projection and a large projection screen/wall for communal gathering areas display capacity and AV; and
- video conferencing capability for communication and collaboration locally and globally.

The greater emphasis on languages in the Australian Curriculum, with the associated opportunity to collaborate and communicate online with native speakers, and the rich information resources available through the world wide web, transform what was previously desirable with regard to virtual conferencing and online access into a necessity.

## Contemporary learning and teaching – a summary

Contemporary learning and teaching involves a shift away from a highly teacher-directed model in which the teacher's focus was to ensure they had 'taught' something to a learning-centred model where each teacher's focus is on ensuring successful learning for each student. Teachers are responsive designers; students are encouraged to develop as self-directed, self-managing students. Table 4 summarises the nature of the shift for a number of different aspects of learning and teaching.

**Table 4: Contemporary learning and teaching versus conventional, industrial era learning and teaching**

Learning and teaching aspect	Conventional, industrial era	Contemporary, knowledge era
<b>Topic and learning experiences</b>	Imposed by teacher. Strictly programmed.	Negotiated in response to collective and individual learning needs and interests.  Flexible, responsive to opportunities.
<b>Response to mistakes</b>	Should not be made.	To be reflected on and learnt from.
<b>Assessment</b>	Written tests and exams Final, summative – a measure of what a student knew or could do.	Multiple assessment strategies to evaluate progress in real contexts where possible.  Ongoing, formative assessment – provides a focus for next steps in learning, what to improve.
<b>Ethos</b>	Competitive against others.	Striving for personal best against criteria and standards.
<b>Determined by</b>	Central authority.	Local and personal needs in the context of a framework – the Australian Curriculum.
<b>Staffed by</b>	Individual teachers – Primary. Subject expert – Secondary.	Collaborative teams of teachers. Cross-curricula teams.
<b>Focus</b>	Teaching centred.	Learning centred.
<b>Teacher role/strategies</b>	Instructor/predominantly direct instruction.	A range of roles from instructor to coach to facilitator to mentor/ strategies range from direct instruction to modelling to prompting and giving feedback to facilitating.
<b>Organisation</b>	One teacher to many students simultaneously.	One to many, one to a few, one to one, any to any.
<b>Student role/strategies</b>	Passive, receptive.	Active, generative, questioning, reflecting, metacognitive.
<b>Student activity</b>	Working alone.	Working collaboratively and alone to develop interdependence and independence.
<b>Emphasis on ‘way of knowing’</b>	Knowing facts and information.	Knowing how and why and how to find out.
<b>Source of knowledge</b>	Books and the teacher’s head.	Books, teachers, other students, digital resources, community experts.
<b>Time for learning</b>	9.00am–3.00pm	Anytime, anywhere.

### 3.7 Creating environments that support contemporary learning

A strategic priority identified in the ACT Infrastructure Plan is to create schools that provide 21st century learning and teaching environments (Table 2). Contemporary learning environments are not ends in themselves. **Contemporary learning environments are very deliberately designed to support the approaches to 21<sup>st</sup> century learning and teaching outlined in Table 4.**

Just as contemporary learning is radically different from conventional industrial era learning so too are contemporary learning environments radically different from the conventional ‘single cell’ classroom with all desks and chairs in rows. Contemporary learning environments are not simply single cell classrooms with a few ‘add on’ spaces—contemporary learning environments have fundamentally different design drivers.

#### Contemporary learning environments

Contemporary 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, individual work;
- student self regulation, self direction and self management;
- holistic, authentic learning— purposeful, meaningful, personally significant, experiential, real projects;
- assessment in context—assessment ‘for’, ‘as’ and ‘of’ learning;
- connectedness—with community, virtually locally and globally, within and across subjects;
- seamless access to rich resources—digital, information, equipment, materials; and
- learning anytime, anywhere, with anyone.

To support contemporary pedagogy, the teaching-centric, ‘single cell’ models of industrial era schooling have given way to students and learning-centred models of pedagogy that require ease of flow between a variety of learning and teaching modes and hence a variety of Learning Settings and spaces. The shift in the basic design driver is illustrated in Figures 2 and 3.

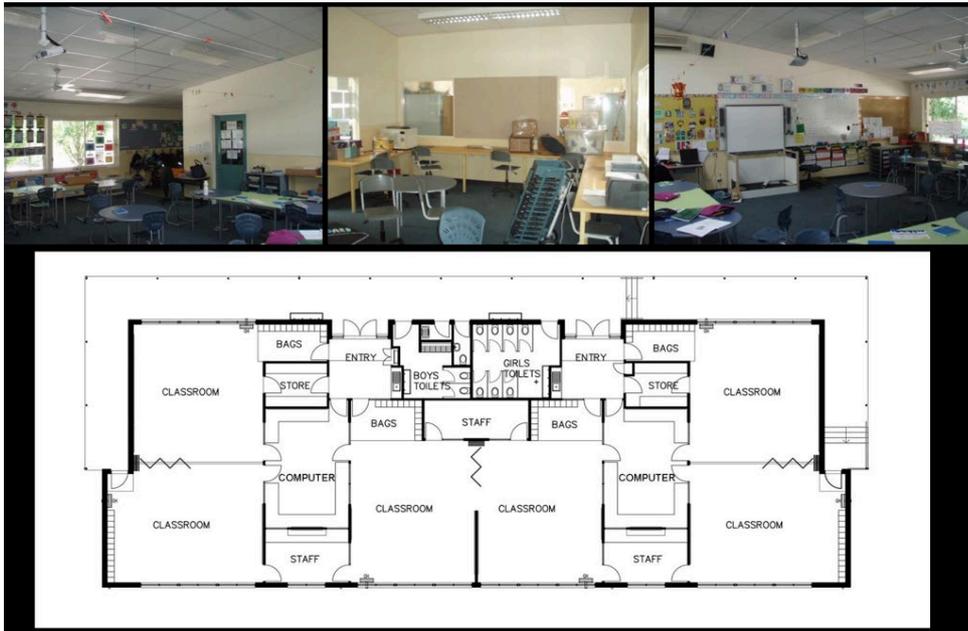
Figure 2 illustrates how a design based on a ‘single cell’, 60m<sup>2</sup> classroom is refurbished as two ‘Learning Neighbourhoods’ with an array of learning settings that are designed to support different learning and teaching activities.

Figure 3 illustrates the shift from a ‘single cell’ design, during extension and refurbishment, to create Learning Neighbourhoods. There are a number of different learning settings to support a full range of learning and teaching activities – whole group gathering and presentations, explicit teaching, create/make indoor and outdoor, collaborative and individual work spaces, dialogue spaces.

Originally there were six classrooms with an open, covered area in between. The covered area originally served as a bag drop and circulation space. With increased enrolment and the demand for additional learning space, rather than add an additional classroom per se, the covered area has been enclosed and scheduled extra area added. Student bag storage has been distributed throughout the Learning Neighbourhoods and used to partition areas and create spaces. The whole space has been re-designed as a set of integrated learning settings. One of the original classrooms has become a STEAM (Science, Technology, Engineering, Arts and Mathematics area for the use of all primary school students while another is an Art workshop space.

**Figure 2** A comparison between design driven by a 'single cell plus' model vs 'integrated purposeful settings' model – Source: *Clarke Hopkins Clarke, Architects, Melbourne.*

- a. The 'single cell', ~60m<sup>2</sup> classroom, is the basic design element – ~150-160 students with 6 teachers



- b. The basic design element is a 'learning setting' – a space fitted out deliberately to support a type of learning/teaching activity. Learning settings are integrated to form, in this example, two Learning Neighbourhoods within a Learning Community.



The shift from a 'single cell plus' design, initially resulted in 'open barn' like spaces with little definition of spaces for different activities. Apart from acoustic issues, the spaces were not well designed to support different types of learning/teaching activities. Gradually learning environment design has become far more sophisticated and learning settings are carefully and purposefully designed and fitted out to support different activities.

**Figure 3 Refurbishment and extension of a classroom block**

Source: Stephen de Jersey, Architect, Townsville

The sketch below (Figure 3) shows the additions and refurbishment of a block of six classrooms, with a covered open area in between, into two Learning Neighbourhoods with a STEAM room and an Art studio both of which are accessible to the whole primary school. Each Learning neighbourhood is made up of a number of different purposefully designed learning settings.



## 4 Education principles and facilities design implications

### 4.1 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.

Two key overarching design principles are:

- responsive design; and
- universal design.

#### Overarching principle – responsive design

One important general overarching design principle is **responsive design**. Whilst being required to address the specific Education Facilities Design Principles the design of the facilities and the facilities management systems must be responsive to the requirements of individual schools and:

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

In addition, 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.

#### Overarching principle – Universal Design<sup>21</sup>

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 to be usable by all people, without the need for adaptation or specialised design. **Universal Design focuses on creating the environment that promotes inclusion.**

**Principle 1.** Equitable use: the design is useful to people with diverse abilities.

**Principle 2.** Flexibility in use: the design accommodates a wide range of individual preferences and abilities.

**Principle 3.** Simple and intuitive: use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

**Principle 4.** Perceptible information: the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

**Principle 5.** Tolerance for error: the design minimizes hazards and the adverse consequences of accidental or unintended actions.

**Principle 6.** Low physical effort: the design can be used efficiently and comfortably and with a minimum of fatigue.

**Principle 7.** 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.

#### 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 – Table 5. These design principles provide a reference point for guiding the design process.

<sup>21</sup> Centre for Excellence in Universal Design <http://universaldesign.ie/exploreampdiscover/the7principles> viewed 5 October 2014

**Table 5 Education Facilities Design Principles**

Education Facilities Design Principles	Universal Design Principles <sup>22</sup> – ‘design for all’
<p><b>Create contemporary learning environments</b> that facilitate the personalisation of learning through:</p> <ul style="list-style-type: none"> <li>• designing integrated learning settings and zones 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, including: <ul style="list-style-type: none"> <li>– direct, explicit teaching, demonstration and presentation</li> <li>– dialogue, story telling, community of inquiry</li> <li>– meetings for discussion, planning and decision-making</li> <li>– structured and free-form interaction and collaboration</li> <li>– creative activities with media, general and specialised equipment and materials</li> <li>– investigative activities with general and specialised equipment and materials</li> <li>– construction, modelling and simulation through play-based learning and/or authentic settings</li> <li>– display of learning resources and student work</li> <li>– quiet reflective activities and/or individual research</li> <li>– rehearsal and performance</li> <li>– gatherings, assemblies ceremonies</li> </ul> </li> <li>• support disciplinary and interdisciplinary learning within and between the Australian Curriculum learning areas for each stage of learning</li> <li>• ensure age-stage appropriate fit out of spaces for learning, recreation and socialisation</li> <li>• provide seamless access to learning by ensuring virtual connectivity locally, nationally and globally</li> <li>• ensure ease of access to learning and teaching resources at the point of use through distribution of appropriate storage throughout learning spaces</li> <li>• activate, invigorate and enrich learning spaces - indoor and outdoor</li> <li>• 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</li> </ul>	<p>Universal Design is the design of products and environments to be usable by all people, without the need for adaptation or specialised design.</p> <p><b>Principle 1. Equitable use</b> The design is useful to people with diverse abilities.</p> <p><b>Principle 2. Flexibility in use</b> The design accommodates a wide range of individual preferences and abilities.</p> <p><b>Principle 3. Simple and intuitive</b> Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.</p> <p><b>Principle 4. Perceptible information</b> The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.</p> <p><b>Principle 5. Tolerance for error</b> The design minimizes hazards and the adverse consequences of accidental or unintended actions.</p> <p><b>Principle 6. Low physical effort</b> The design can be used efficiently and comfortably and with a minimum of fatigue.</p> <p><b>Principle 7. Size and space for approach and use</b> Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.</p>
<p><b>Support a sense of community and belonging both within the school and the school within the wider community.</b> Design facilities that:</p> <ul style="list-style-type: none"> <li>• are welcoming and promote inclusion of the community</li> <li>• actively promote community access and engagement</li> <li>• have a human, family feel as opposed to an institutional feel</li> <li>• have community focal points that create wholeness and oneness through gatherings, incidental crossroads and serendipitous social interaction</li> <li>• support learning neighbourhoods and learning communities as the basic organisational structure</li> <li>• involve the sharing of resources and learning spaces</li> <li>• inspire participation in, and responsibility for the student's community and respect for others and property</li> <li>• provide Facilities that can be shared by the community to host a diversity of purposes, including out of school hours support, for building a community culture</li> <li>• respond to the local context and assist in creating a local context for new communities</li> <li>• promote integration over segregation including integration of re-locatable buildings through innovative design and effective master planning</li> </ul>	

<sup>22</sup> Centre for Excellence in Universal Design <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/> - p1

Commercial in confidence

<b>Education Facilities Design Principles</b>	<b>Universal Design Principles<sup>22</sup> – ‘design for all’</b>
<p>Support <b>collaborative learning and teaching for professionals</b> by:</p> <ul style="list-style-type: none"> <li>• making provision for meeting spaces for professional collaboration and planning in small, medium and large groups</li> <li>• enabling teacher modelling, mentoring and peer observation by ensuring teaching is visible and can be observed unobtrusively <i>in situ</i></li> <li>• designing learning spaces for seamless flow of students and teachers between integrated learning settings and spaces</li> <li>• the deliberate layout of the learning settings to provide for seamless access to and from</li> <li>• required resources and ease of flow between spaces.</li> <li>• the juxtaposition of spaces ensuring continuity and appropriate merging of atmosphere and acoustic requirements</li> <li>• providing fit out of the learning settings that is appropriate to the curriculum focus and specific learning activities for which the setting is designed.</li> </ul>	
<p><b>Promote and support enhanced inclusion, access and choice for all students by</b></p> <ul style="list-style-type: none"> <li>• provide signage, display areas, meeting and gathering spaces to honour and celebrate cultural diversity and contribute to the development of intercultural understanding</li> <li>• promote and support enhanced inclusion of students with special learning needs</li> <li>• 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</li> <li>• provide choice in learning settings</li> </ul>	
<p><b>Design facilities that are aesthetically pleasing, welcoming and support the physical, emotional and social wellbeing of the students and staff by</b></p> <ul style="list-style-type: none"> <li>• providing a welcoming entry to all facilities</li> <li>• providing indoor conditions and amenity that support and enhance learning</li> <li>• promoting delight and inspiration among students and the broader school community</li> <li>• educating the aesthetic imagination and the senses</li> <li>• including informal community and social spaces and hubs and thus opportunities for students to further develop personal and social capability</li> <li>• providing a continuum of learning and recreation</li> <li>• actively promoting the safety and security of all students, staff and visitors and minimise security risks for buildings and other school assets</li> <li>• integrating facilities with the natural and urban environment</li> <li>• 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</li> </ul>	

## 5 Functional Specifications for ACT Public Schools

### 5.1 General introduction to functional specifications

The Facilities design must:

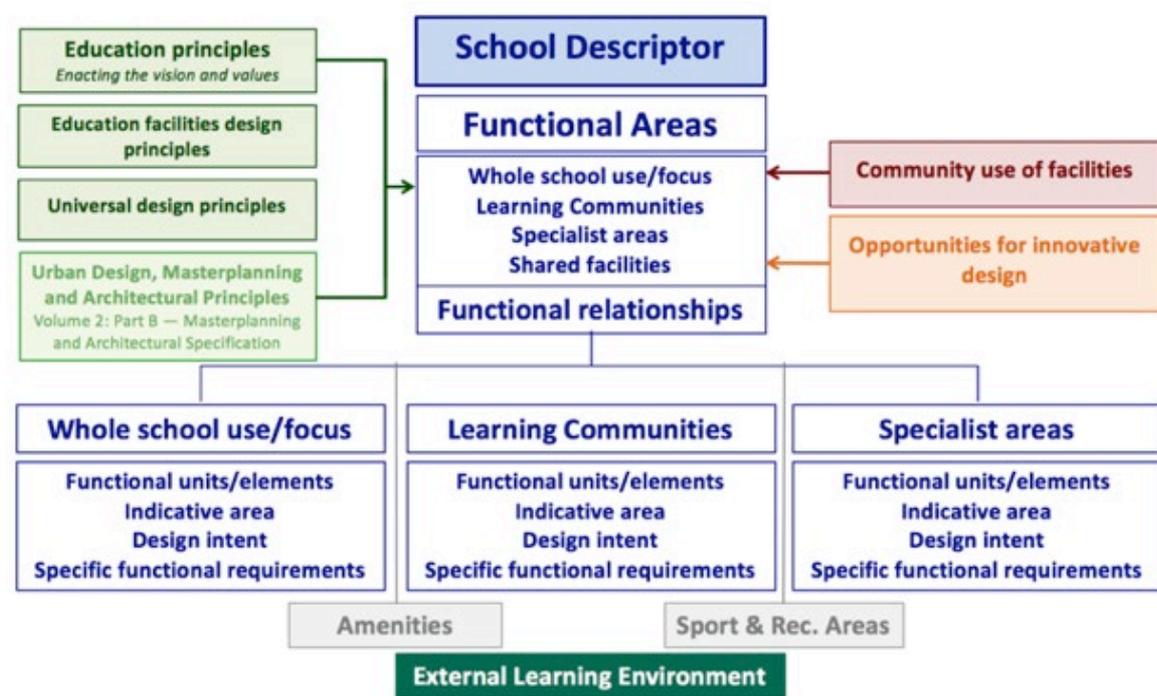
- support the Education Principles derived from the Directorate’s vision, values and priorities;
- be underpinned by the Education Facilities Design Principles outlined in Table 5;
- incorporate Universal Design Principles;
- address the Architectural Design Principles presented in *Volume 2 Part B Masterplanning 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;
- meet the functional requirements for Learning Settings that make up 21<sup>st</sup> century learning environments as outlined for each Functional Area and are summarised in Table 10; and
- meet other educational and non-educational requirements as set out in the *Output Specification*.

### 5.2 How the functional specifications are structured

The design requirements set out in this Functional Brief describe the functionality of all internal and external areas of the school. The functional specifications follow the structure shown in Figure 4.

- The school descriptor determines the Functional Areas required.
- Essential functional areas, to deliver the curriculum, accommodate the needs of diverse students and provide facilities that can be shared with the community, are listed.
- Indicative whole site Functional Relationships are illustrated in diagrammatic form.
- The design intent, indicative area, operational factors to consider and the general and specific functional requirements are described and illustrated for each Functional Area/Unit.

Figure 4 Structure of the functional specification section



### 5.3 Definition of terms

The replacement of the traditional 'single-cell' classroom 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 6.

**Table 6: 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, General Purpose Hall.

**Functional Units** — spaces within a Functional Area that serve identified functions e.g. reception within the administration area, teachers' workspace within a Learning Community.

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

#### Terms related to Learning Communities:

**Learning Community** — the general term Learning Community refers to an organisational grouping of students and teachers. The size of a Learning Community can vary according to a school's preferred organisational structure and/or the size of a particular cohort. For example, within a P–6 school in the ACT the children and educators in the Preschool could be classed as the Preschool Learning Community. The types of Learning Communities identified vary from school to school. Some schools have Learning Communities structured as Kindergarten–Year 2 Learning Community, Year 3–Year 4 Learning Community and Year 5–6 Learning Community. In very large schools there could be two Learning Communities for each of these stages. In other schools Learning Community groupings might be structured around a number of communities that include children from Kindergarten to Year 6. Schools often give unique names to their Learning Communities. The size of Learning Communities in P–6 schools varies depending on the organisational structure adopted by individual schools.

**Learning Community Building(s) or Area** — refers to the actual facility, building or area in which a Learning Community is based. Ideally a Learning Community is housed in one building.

**Learning Neighbourhood** — a Learning Neighbourhood is a subset of a Learning Community. A Learning Neighbourhood acts as the 'learning home' for a group of students 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 students who share the 'learning home'.

Learning Neighbourhoods can range in size. The Directorate's commitment to professional collaboration and professional mentoring dictates that the minimum size of a Learning Neighbourhood is two teachers with a neighbourhood group of students that could range in size from approximately 30 to 50 students depending on the school and the range of needs of the needs. The maximum size of a Learning Neighbourhood in a Primary School is generally  $\leq 100$  students. In contemporary learning environments, many resources and learning spaces are shared within a Learning Neighbourhood.

#### Terms related to Learning Settings:

**Learning Setting** — a learning setting is essentially a functional unit designed specifically for different learning and teaching activities. A learning setting is a space configured and fitted out with furniture and equipment (including digital media) to support one or more related learning activities e.g. a 'community of inquiry' setting that supports reading circle activities, dialogue sessions, mentoring meetings etc., 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 or one that is equipped to engage the senses.

General purpose Learning Setting describes an area, unit or setting that supports a range of related uses e.g. some Learning Settings within a Learning Neighbourhood can be used for a common activity for a large group of students working in small teams or it can serve small teams of students working on a range of different activities independently.

Multi-purpose Learning Setting describes an area or unit that can have a range of uses and users, e.g. a gym can be used for physical education, music, dance and drama education, school gatherings, assemblies and ceremonies, after school hours care and community sports.

Special purpose Learning Setting applies to spaces that are designed for a limited range of purposes that require specialised equipment, fit out and/or special conditions e.g. a technology workshop, a small meeting room, and a sensory room.

#### Terms related to school organisational models:

**Sub-school** — is an organisational structure adopted by some primary schools and some secondary schools to group students in bands of year groups, for example in primary School — K–2, 3–6 and in secondary schools — Year 7–8, Year 9–10, with a team of teachers who have responsibility for the learning and wellbeing of the students in that sub-school. The team of teachers spend the dominant part of their allocated teaching time with students in their sub-school.

House or School within School (SWIS) – is an organisational structure adopted by some large schools (primary and secondary) to group students in vertical age groups with a team of teachers who have responsibility for the learning and wellbeing of the students. The team of teachers spend the dominant part of their allocated teaching time with students in the House but can also teach courses across the Houses. In SWIS models, the pastoral and well being groupings are generally vertical while the learning groups are according to the needs and readiness of students.

**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.

An activated space or Learning Setting is one that is purposefully enriched with furniture resources, displays and/or equipment with which students can readily engage. 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: Indicative areas provide an indication of the area required to address the specified functionalities.**

The micro-environment refers to the aesthetic and sensory qualities of an environment.

Modular buildings, in this context, are prefabricated buildings used to accommodate students when enrolments are expected to exceed long-term enrolments for an extended period of 15 plus years. Modular buildings for Canberra Public Schools are designed to replicate, very closely, the design of the permanent school buildings.

Transportable buildings, in this context, are used to accommodate students for shorter-term peak situations. These enrolment spikes can extend for a period of 5–20 years. Transportable buildings use a standard building envelope design. The number of transportable buildings required will differ according to the demographics of particular sites.

## 5.4 Community use of Facilities

All 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 shared use with the Community.

- The Library/Interactive Learning Resource Centre.
- The Multipurpose Room that is briefed as an integral component of the Library/Interactive Learning Resource Centre.
- The General Purpose Hall.
- Before and after school care areas.

There are other opportunities to design facilities for shared use with the Community. These include:

- community garden;
- hard courts;
- play equipment;
- Science, Technology, Engineering, Arts and Maths (STEAM) centre; and
- digital media facilities.

The configuration of Facilities must support opportunities for use outside school hours by the small and large groups of users drawn from the wider community without presenting any limitations for operation on the school.

## 5.5 Area allocation

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. Rather than allocate specific area to rooms, an indicative area for a function or set of functions is stated. To encourage innovation and efficient design, the Schedule of Accommodation has been provided as an aggregated sum for various Functional Areas rather than a specified area allocation for individual rooms.

## Indicative areas for Functional Areas and Functional Units

### Preschool

Preschool functional units are specified in the **Education and Care Services National Regulations**<sup>23</sup> and outlined in Australian Children's Education and Care Quality Authority's *Guide to the National Quality Standard*.<sup>24</sup> The requirements for internal and external unencumbered activity space are prescribed as follows:

- internal unencumbered space 3.25m<sup>2</sup>/child; and
- external unencumbered space 7.00m<sup>2</sup>/child.

Other functional units are not regulated. The indicative area allocation given in this document is based on numbers of users and research on contemporary designs.

### Primary School – Kindergarten to Year 6

The indicative area allocation for the major Functional Areas are provided in summary form in Table 7. These indicative 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.

More specific indicative areas allocations are listed for each Functional Area in **Section 7: Detailed Functional Specifications for a P – 6 School**.

### External Learning

The areas of a school site that are to be masterplanned include:

- permanent buildings;
- relocatable buildings;
- external functional areas; and
- external amenities – garden shed, bike storage, toilets.

The area of the site that is required to be designed and landscaped is set out in Table 7. Only the area of the school site necessary to meet the required functionalities is required and expected to be included in the overall landscape design.

### Engineering plant and equipment

The design must provide adequate area for plant, amenities and travel (both internal and external). Indicative area has been allocated to accommodate 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. Consideration needs to 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.

### Amenities provision

Toilets are to be distributed throughout the permanent and modular facilities to meet or exceed BCA requirements for peak enrolments. The number of toilets must support school functionality, particularly considering the need for intensive use during breaks. The toilet amenities should be equitably distributed to meet the needs of the entire school community.

### Travel and circulation

In contemporary designs, corridors are not as prevalent as they were in traditional schools and workplaces.

A travel allocation has been provided in Table 7. 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 but space is still required to support free flow circulation.

For guidance, indicative area provision for internal travel shown in Table 7 is based on 17% of nett briefed permanent area. The contractor must demonstrate that the design makes provision for students and staff to travel around and through the facilities without adverse impact on adjacent functionalities.

<sup>23</sup> <http://www.legislation.nsw.gov.au/fullhtml/inforce/subordleg+653+2011+ch.4-pt.4.3+0+N?>

<sup>24</sup> <http://www.acecqa.gov.au/national-quality-framework/the-national-quality-standard>

**Table 7: Summary of Indicative Areas for internal and external Functional Areas**

<b>FUNCTIONAL AREAS - INTERNAL</b>	<b>Permanent buildings provided for an enrolment of 450</b>	<b>Permanent buildings provided for an enrolment of 600</b>
Leadership, Administration and Staff Centre	392 m <sup>2</sup>	468 m <sup>2</sup>
Library/Interactive Learning Centre	270 m <sup>2</sup>	320 m <sup>2</sup>
Preschool Learning Community	332 m <sup>2</sup>	468 m <sup>2</sup>
Learning Communities P–6 [includes Staff Work Areas]	1935 m <sup>2</sup>	2580 m <sup>2</sup>
Specialist Activity Learning Areas: Performing Arts and Physical Education	984 m <sup>2</sup>	990 m <sup>2</sup>
Specialist Activity Learning Areas: Environmental Science, STEAM	105 m <sup>2</sup>	105 m <sup>2</sup>
Canteen	68 m <sup>2</sup>	83 m <sup>2</sup>
<b>Total Functional Areas</b>	<b>4086 m<sup>2</sup></b>	<b>5009 m<sup>2</sup></b>
Amenities: distributed Cleaners' stores	10 m <sup>2</sup>	10 m <sup>2</sup>
Amenities: staff shower & change	13 m <sup>2</sup>	13 m <sup>2</sup>
Amenities: student shower & change	26 m <sup>2</sup>	26 m <sup>2</sup>
Internal Travel (17% of nett briefed permanent area excluding Primary Learning Communities)	397 m <sup>2</sup>	453 m <sup>2</sup>
Engineering Plant & Equipment (1% of nett briefed permanent area)	41 m <sup>2</sup>	51 m <sup>2</sup>
<b>TOTAL AREA</b>	<b>4573 m<sup>2</sup></b>	<b>5562 m<sup>2</sup></b>
<b>FUNCTIONAL AREAS - EXTERNAL</b>	<b>Enrolment of 450</b>	<b>Enrolment of 600</b>
Staff Lounge Courtyard	20 m <sup>2</sup>	25 m <sup>2</sup>
Library External Courtyard	40 m <sup>2</sup>	40 m <sup>2</sup>
Preschool external learning settings	7 m <sup>2</sup> /child (minimum)	7 m <sup>2</sup> /child (minimum)
Primary (K-6) external learning settings	1.5 m <sup>2</sup> /student	1.5 m <sup>2</sup> /student
Hard Courts	1580m <sup>2</sup>	1580m <sup>2</sup>
Bike storage – students	As per Technical Specifications	As per Technical Specifications
Bike storage - staff	As per Technical Specifications	As per Technical Specifications
Parking	As per Technical Specifications	As per Technical Specifications
Sportsfield	Site specific	Site Specific
Primary (K-6) Play equipment	1.75 m <sup>2</sup> /student	1.75 m <sup>2</sup> /student
Natural, imaginative play areas	1 m <sup>2</sup> /student	1 m <sup>2</sup> /student
Active open informal games area(s) [Excluding hard courts, district sports fields]	4 m <sup>2</sup> /student	4 m <sup>2</sup> /student
Gathering and performance space(s)	1 m <sup>2</sup> /student	1 m <sup>2</sup> /student
External Travel	151 m <sup>2</sup>	184 m <sup>2</sup>

Table 8: Detail for each Functional Area

FUNCTIONAL AREAS - INTERNAL	Permanent buildings provided for an enrolment of 450	Permanent buildings provided for an enrolment of 600
<b>Leadership, Administration and Staff Centre</b>	<b>392 m<sup>2</sup></b>	<b>468 m<sup>2</sup></b>
Reception/foyer	From travel	From travel
General Office	40 m <sup>2</sup>	50 m <sup>2</sup>
Secure Store	25 m <sup>2</sup>	28 m <sup>2</sup>
Uniform storage	4 m <sup>2</sup>	6 m <sup>2</sup>
Business Manager's Office	12 m <sup>2</sup>	12 m <sup>2</sup>
Leadership Area	44 m <sup>2</sup>	68 m <sup>2</sup>
Conference/Meeting Room	30 m <sup>2</sup>	30 m <sup>2</sup>
School Psychologist's Office/Meeting	15 m <sup>2</sup>	15 m <sup>2</sup>
Interview/Meeting Room(s)	22 m <sup>2</sup>	34 m <sup>2</sup>
Staff Lounge	80 m <sup>2</sup>	95 m <sup>2</sup>
Staff Resource/Utilities	20 m <sup>2</sup>	25 m <sup>2</sup>
Sick Bay	40 m <sup>2</sup>	40 m <sup>2</sup>
Staff Retreat Room	10 m <sup>2</sup>	10 m <sup>2</sup>
Facilities Management Workroom	50 m <sup>2</sup>	55 m <sup>2</sup>
<b>Library/Interactive Learning Centre</b>	<b>270 m<sup>2</sup></b>	<b>320 m<sup>2</sup></b>
Main Library Area	150 m <sup>2</sup>	200 m <sup>2</sup>
Community Multipurpose Area	90 m <sup>2</sup>	90 m <sup>2</sup>
Virtual conference/meeting room	15 m <sup>2</sup>	15 m <sup>2</sup>
Staff Work Area	15 m <sup>2</sup>	15 m <sup>2</sup>
<b>Preschool Learning Community</b>	<b>332 m<sup>2</sup></b>	<b>468 m<sup>2</sup></b>
Meeting/entrance	25 m <sup>2</sup>	30 m <sup>2</sup>
Play rooms	180 m <sup>2</sup>	270 m <sup>2</sup>
Quiet activities	30 m <sup>2</sup>	45 m <sup>2</sup>
Store Room	18 m <sup>2</sup>	27 m <sup>2</sup>
Kitchen	15 m <sup>2</sup>	15 m <sup>2</sup>
Equipment/Store Room	40 m <sup>2</sup>	45 m <sup>2</sup>
Teacher work space	24 m <sup>2</sup>	36 m <sup>2</sup>
Learning Communities P-6 [includes Staff Work Areas]	<b>1935 m<sup>2</sup></b>	<b>2580 m<sup>2</sup></b>
Learning Neighbourhoods 4 m <sup>2</sup> /student	1800 m <sup>2</sup>	2400 m <sup>2</sup>
Staff Work Areas	135 m <sup>2</sup>	180 m <sup>2</sup>
Specialist Activity Learning Areas: Performing Arts and Physical Education	<b>984 m<sup>2</sup></b>	<b>990 m<sup>2</sup></b>
Multipurpose Hall	820 m <sup>2</sup>	820 m <sup>2</sup>
Sports Equipment Store	50 m <sup>2</sup>	50 m <sup>2</sup>
Music/Drama	114 m <sup>2</sup>	126 m <sup>2</sup>
Specialist Activity Learning Areas: Environmental Science, STEAM	105 m <sup>2</sup>	105 m <sup>2</sup>
Canteen Facilities	68 m <sup>2</sup>	83 m <sup>2</sup>
<b>Total Area</b> [not including travel and engineering]	<b>4086m<sup>2</sup></b>	<b>5009m<sup>2</sup></b>

## 5.6 Relocatable buildings

Relocatable buildings are used to accommodate peak and extreme peak enrolments in new suburbs. The tendency in Canberra is for the peak enrolment to last for 15 plus years while the extreme peak enrolment can be for five to 10 years. The two types of relocatable buildings used in Canberra public schools are Modular Buildings and Transportable Buildings.

### Modular Buildings

In this context, modular buildings are prefabricated buildings purpose designed to accommodate students when enrolments are expected to exceed long-term enrolments for an extended period of 15 plus years. Modular buildings for Canberra public schools **must be designed to replicate the design of the permanent build Learning Communities**. The layout of the modular buildings on the site and the internal fitout of modular buildings must be integrated into the overall school design and include the same functionalities and amenities that are briefed for the permanent Learning Communities.

### Transportable Buildings

In this context, transportable buildings are used to accommodate students for shorter-term peak situations when the enrolment goes beyond the predicted peak enrolment. These enrolment spikes can extend for a period of 5–10 years. Transportable buildings use a standard building envelope design. The number of transportable buildings required will differ according to the demographics of particular sites. **Master planning must factor in locations for the transportable buildings that ensure integration with the permanent and modular buildings**. The education facilities design principles (Table 5) apply equally to transportable buildings and their layout arrangements as they do to the design and layout of permanent buildings. **The interior of the transportable buildings must be fitted out to provide the functionalities briefed for the permanent buildings** of equivalent function.

## 5.7 Naming of the school and functional areas

A provisional name has been used to identify the school in the project documentation. It is possible that the school name will be changed to better identify the school in its community and neighbourhood context.

Similarly, naming of functional areas and functional spaces in the Output Specification is provisional only. It is possible that names for some spaces and functions at the school will be changed by the appointed principal to better identify the purpose of these spaces within the school's individual education and resource management plan. By way of example, the administration functional area could be re-named as a Leadership and Administration Centre.

# 6 Design and operation of a P–6 school

## 6.1 School descriptor – Preschool to Year 6

Public P–6 schools in Canberra provide **early childhood education** and **primary school education** for students from the age of four years (birthday before April 30). Since 2008 a P–6 school consists of an integrated Preschool component and a Primary School component. A public Preschool 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 Preschool 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 hrs per week.

Many existing Preschools in Canberra have a sense of being co-located with a Primary School. This is a legacy of past policy. The design of all new P–6 and P–10 public schools in Canberra incorporate a Preschool Learning Community as an integral part of the school while maintaining a distinct early childhood character and identity.

## 6.2 Preschool philosophy

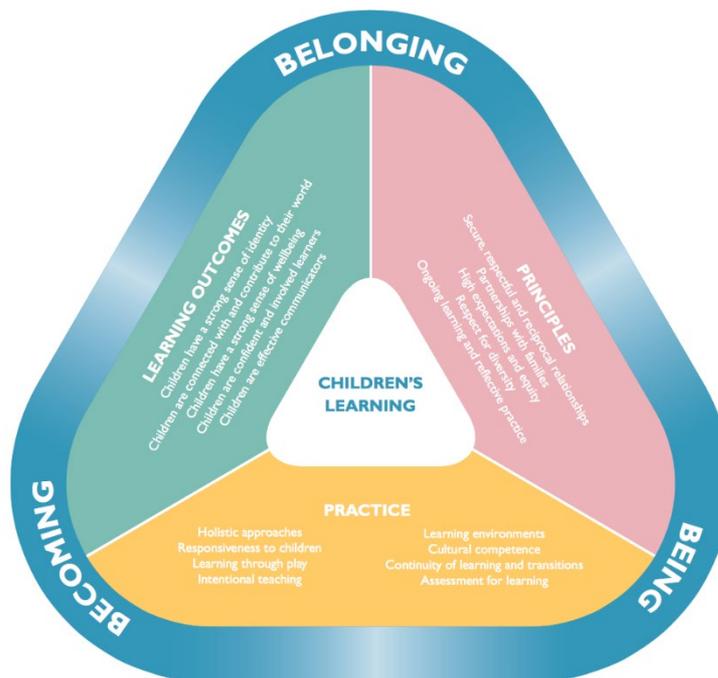
Early childhood education recognises that children's learning happens from birth, and those working with children in professional settings have an important role to play in enhancing children's learning and development. This can occur through intentional teaching moments during children's play, as well as through typical 'care' practices, such as toileting and meal routines.

The role and importance of early years learning, and a framework to guide early childhood education is laid out in *Belonging, Being and Becoming: The Early Years Framework for Australia*.<sup>25</sup> The early years framework aims ‘...to extend and enrich children’s learning from birth to five years and through the transition to school’. The framework’s vision for early childhood education is:

All children experience learning that is engaging and builds success for life.<sup>26</sup>

Public Preschools 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 preschools.

**Figure 5: Early Years Framework**



## Preschool Curriculum

In the early childhood setting curriculum means ‘all the interactions, experiences, activities, routines and events, planned and unplanned, that occur in an environment designed to foster children’s learning and development’.<sup>27</sup>

## Preschool Pedagogy

The learning of young children is naturally dynamic, complex and holistic. Children actively construct their own understandings and contribute to others’ learning.

Educators view children as active participants and decision makers. Pedagogy is based around play based learning which provides a context for learning that:

- allows for the expression of personality and uniqueness;
- enhances dispositions such as curiosity and creativity;
- enables children to make connections between prior experiences and new learning;
- assists children to develop relationships and concepts; and
- stimulates a sense of wellbeing.<sup>28</sup>

<sup>25</sup> Australian Government DEEWR (2009) *Belonging, Being and Becoming: The Early Years Framework for Australia*, [https://www.coag.gov.au/sites/default/files/early\\_years\\_learning\\_framework.pdf](https://www.coag.gov.au/sites/default/files/early_years_learning_framework.pdf) viewed February 2015

<sup>26</sup> *ibid* p7

<sup>27</sup> *ibid* p9

<sup>28</sup> *ibid* p9

## Operational Factors – Preschool

Schools have different ways of operating their Preschool Learning Community. One way of operating a Preschool Learning Community involves one teacher and one support staff working with two groups of 22 preschool children attending preschool five days over a fortnight (eg: three days one week, two days another week).

The Preschool Learning Community is an integral part of the school. The staff work closely with F–2 teachers as part of an early childhood team and access all the facilities of the school. The preschool children use the Library, the Performing Arts and Physical Education facilities and any other school facilities that enhance their learning program.

### 6.3 Primary school: Kindergarten–Year 6

Primary school marks the beginning of the phase 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 student. Primary school education provides the foundation for learning for life. It shapes children’s expectations of learning success, their expectations of what learning at school is for, their capabilities and responsibilities as a student and how learning and teaching interrelate.

Schools that have undergone a transformation from a teacher and teaching-centric model of education to a student and learning-centred model note that the students who have least difficulty with the new approach are the Kindergarten students who learn from day one that school is centred around their learning, their learning progress, their learning capabilities and helping each other. They learn that is how school works. Older students, who began school in a teaching and teacher-centred model can have more difficulty adapting at first because they have to learn ‘new rules’ for how to operate. Setting up ‘soft systems’, e.g. expectations of learning behaviour, understanding roles in helping each other learn and understanding the impact their behaviour can have on others’ learning is crucial to effective learning in a contemporary learning environment.

### Transition to school

One of the distinct advantages of the ACT P–6 schools is the integration of early childhood education with school education. This has the immediate potential to strengthen student transitions and develop curriculum and programs that integrate early childhood education with school education.

## Pedagogy and Curriculum – Kindergarten to Year 6

### Pedagogy

Learning in K-2 and Year 3-4 focuses on the early years development outcomes:

- developing a strong sense of identity;
- connecting and contributing to their world;
- ensuring a strong sense of wellbeing;
- developing confidence and involvement as students; and
- becoming effective communicators.

Play-based learning, inquiry driven learning and targeted teaching in small groups are key features of early years pedagogy as children learn to manage their own learning and belongings and contribute to their Learning Communities. Inquiry, collaboration, authentic project based learning and personalised learning plans continue throughout the primary school years with students growing in independence, self-direction and self-knowledge as students.

Regular assessment, both formative and summative, is largely conducted in context. Self, peer and expert assessment on both the process and product of authentic projects is common. Online real-time assessment and reporting is increasing the personalisation of assessment and increasing the immediacy of assessment information for parents and carers.

From Kindergarten right across the primary school years, children access and use ICT in a range of ways to enable and enrich learning, to communicate, research and access information and for creative expression. In addition to enhancing learning, engagement with ICT ensures that students develop the skills to participate and contribute in a technologically rich world.

### Curriculum

Primary schools are responsible for implementing several stages of each of the Learning Areas of the Australian Curriculum. This does not mean separate ‘subjects’ or separate ‘timetabled sessions’ in ‘separate spaces’. The approach is intended to emphasise curriculum planning that ensures students are able to engage with and learn the defined content in a continuous way from Kindergarten to Year 6 and with an approach to learning that is aligned with

the Directorate's approach to pedagogy. All Learning Areas of the Australian Curriculum are included for K–6 but with varying degrees of emphasis and explicitness.

The functional specifications for primary school facilities are based on requirements of the Australian Curriculum and contemporary learning and teaching. The Education Principles articulate the Directorate's vision for education, the Education Facilities Design Principles translate the Education Principles into principles to guide the design of the facilities, the specific role played by primary schools and alignment with the Directorate's approach to learning and teaching.

## Operational Factors – Primary School

### Nature and times of use of the facilities

The timetabled hours are typically 9.00 am – 3:00 pm with students arriving at school from 8.30am onwards, but this varies according to local circumstances and individual school arrangements. The schools operate on a four term year of 10 weeks each. 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.

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.

Contemporary 21C primary schools operate very differently to a traditional industrial era school. Effective design of contemporary learning environments requires an understanding of the daily operation of Learning Neighbourhoods and Learning Communities. What follows is just one scenario that represents ways in which contemporary learning and teaching plays out in a primary school. It is intended to convey a feel for the way in which primary schools operate on a day-to-day basis and the way in which students and teachers flow between learning settings.

### A day in the life of a primary school

The day in the life scenario below is based on a possible Year 3–4 Learning Community of **133 students and seven teaching and support staff**. The Learning Community is made up of two Learning Neighbourhoods—Table 9. Nuru Learning Neighbourhood has three teachers and 75 students while Muyuluṅ has three teachers, a teacher support and 58 students. Eight students in the Year 3–4 Learning Community meet the ACT Student with Disability Criteria for Intellectual Disability.

**Table 9: One possible Learning Community Structure**

Year 3–4 Learning Community	
Nuru Learning Neighbourhood	Muyuluṅ Learning Neighbourhood
75 students in Years 3 & 4	58 students in Years 3 & 4
A teaching team of three	A teaching team of 3 teachers and one support teacher

### A day in the life of Nuru Learning Neighbourhood

Jess rides to school, showers and changes in the Staff Centre and then joins Matt and Annabelle, the other members of her team, in the staff work area of their Learning Neighbourhood to finalise their program for the day. Jess, Matt and Annabelle have joint responsibility for the learning and pastoral care of 75 students in Year 3 and Year 4. The team has established a general pattern to their day. There are four broad types of learning activities that occur during the week which are organised around language/literacy, maths/numeracy, discovery, health and creative expression.

The team spends some time reflecting on the progress of their students from the day before. For language/literacy and maths/numeracy the students are arranged in flexible groupings of between 5-10 students according to their learning needs. Jess notes that two of the students in one of her small groups have suddenly 'clicked' on a concept they were having difficulty with and she suggests they join one of Matt's groups.

The team spends some time discussing the progress of other students in maths/numeracy who either need more explicit help or are ready to progress to the next stage, they then re-arrange groupings,

and discuss the general approach they are taking to other aspects of the day's program as the children start to arrive.

As the students arrive they move to their home base areas and unpack and store their belongings and bags. Some immediately start engaging with their mobile devices or gather as a group around AV displays to watch a video clip, others gravitate towards the teachers, others socialise in small groups while others head back outside to play handball.

As the formal part of the day begins students from this neighbourhood gather together in one large group to focus on the program for the day. They break from the whole neighbourhood gathering and students spend time in their home-bases planning their specific goals for the day. Jess and Matt call their small maths/numeracy groups to separate quiet, explicit teaching settings where they work with them around a table for about 20 minutes.

Matt's group is joined by Michael from the Muyuluŋ Learning Neighbourhood, the other Learning Neighbourhood in the Year 3–4 Learning Community. Michael, who has been diagnosed with an autism spectrum disorder, is supported in a small home-base for much of his learning. He achieves high standards in maths/numeracy and joins the advanced group in the Nyuru Learning Neighbourhood for his maths/numeracy learning.

Annabelle moves between the other students who are now working collaboratively on maths problems together or working individually to consolidate their maths/numeracy learning using their mobile devices. A support teacher enters the neighbourhood and finds one of the students who is visually impaired and assists her, and the students working with her, with their learning.

For an hour and a half, groups are rearranged, teachers change roles, students move between activities while the focus remains on maths/numeracy. After the recess break the students return to their neighbourhood and excitedly gather in groups ranging in size from four to 10 students to continue their work towards re-enacting a scene from the book they have been reading together as a Learning Neighbourhood. The plan is to present their re-enactments to the other neighbourhoods in their community. Some groups are busy painting, others are editing a video and introducing their soundtrack while others are rehearsing in a performance setting in view outside the neighbourhood. The three teachers move between the groups advising, challenging, questioning and giving feedback. At the end of this session each of the teachers gathers the students together in three large groups that distribute themselves into three different locations and spend time reflecting on where they are up to in terms of being ready to present their re-enactments. They reflect on what is going well, the challenges they have and how they plan to overcome them and then set plans for work that needs doing after school to help them move forward again tomorrow.

For the next session the students move to PE, Performing Arts or Mandarin to learn with specialist teachers until lunch time while Jess, Matt and Annabelle have their timetabled design and planning session in their staff work area. The group involved in their Mandarin session today are busily getting organised to meet face to face via Google apps with their sister class groups in Suzhou. Groups are rehearsing their introductions and getting feedback on their pronunciation, another group is setting up the virtual conferencing space to make sure all of their group can be seen and heard.

After lunch the neighbourhood is abuzz again as the students form into three broad groups for their ongoing discovery work in Humanities and Social Sciences. Students have framed inquiry questions around how and why a specific change occurred in the past. Some students are working individually while others are working in groups of three to six or seven. As an example of the types of projects they have taken on, one large discovery group has several groups working on uncovering the factors that influenced the development of Lake Burley Griffin and the impact of this development. One of the small teams in this group is attempting to build a model of the ACT before the Molonglo River was dammed and have plaster-of-paris all over the creative/investigative area, others are intrigued by the factors that shaped the timing of when the lake was actually created, and the evolution of its design from Scrivener's original ideas, and have a large timeline on butcher paper on the floor adorned with post-it-notes of events. Others are researching the impact of the damming of the Molonglo River on areas downstream and have invited members of the Molonglo Catchment Group to talk with them and give them feedback on their research so far and their thoughts about the actions the team is considering that they might take as a result of their research. Melissa, the Science specialist at the school has joined this group to help guide the students and to be informed so that she can provide support in the action phase of the project.

The day is drawing to a close and students pack up their discovery project work, tidy the neighbourhood and move to their home-bases where each teacher meets with the 24 or 25 students

who are their immediate responsibility. Students spend time reflecting on the goals they set for the day, what was achieved, what was not achieved, plan their homework and receive individual feedback from their home-base teacher before leaving school for the day.

The teachers move off to bus duty, netball practice etc.

#### **A day in the life of the Muyulun Learning Neighbourhood**

Muyulun Learning Neighbourhood has four staff and 58 students. Muyulun is made up of three home-bases – two with 25 students and one with eight students and two teaching staff.

The small home-base group of eight students is provided more support due to identified special needs. This home-base has direct access to a secure external courtyard/sensory garden and one of the smaller rooms in this home base area has been fitted out with generous storage to hold a range of equipment and small furniture items. The space is readily adapted for use as a quiet room, as a small acoustically contained teaching space, or as a therapy space for use by speech pathologists and occupational therapists.

Although the students who belong to the small home base of eight students spend the majority of their time with their home-base teacher and support staff, as with Michael, who joins the adjacent Nuru Neighbourhood for maths/numeracy, students with special needs are integrated with other groups in their own Learning Neighbourhood as well as the adjacent Learning Neighbourhood according to their readiness, interests and needs. All three home bases come together regularly for neighbourhood activities.

The teachers in the other two larger home-bases work responsively to arrange students in groups in a very flexible manner according to their learning progress.

The Learning Neighbourhoods and Learning Community described above represents just one of many possible arrangements of staff and students in neighbourhoods and communities. One of the strengths of contemporary design is the fact that schools can decide on the specific arrangement of staff, students and the use of space according to the needs of the students. A number of possible organisational arrangements for Learning Neighbourhoods is described in Section 7.4.

### **6.4 Functional areas for a P–6 school**

P–6 Functional Areas and Functional Units consist of indoor and outdoor areas for learning and play, social and 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. general purpose hall, library–learning resource centre, performing arts);
- whole school focus, (e.g. administration and school leadership);
- largely used by a particular group of students or staff (e.g. Learning Communities, staff lounge);
- specialist facilities with specific equipment or conditions; and
- shared use facilities for use 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** (Section 5.3 Definition of Terms, Table 6).

#### **Essential Functional Areas and Functional Units for whole school use**

- Leadership, Administration and Staff Centre.
- Library/Interactive Learning Resource functionality – centralised and distributed.
- Community centre/multipurpose facility.
- General Purpose Hall

#### **Essential Functional Areas and Functional Units for a Preschool Learning Community**

The key Functional Area for the Preschool is the dedicated Preschool Learning Community.

- Entrance zone.
- Preschool Play Rooms.
- Quiet activities areas.
- External learning environments.
- Kitchen/kitchenette facilities.

- Workspace for Preschool staff that fosters collaboration.
- Interview/Meeting Room.
- Equipment storerooms.
- Garden.
- Preschool children and staff amenities—pre-school toilets, accessible toilet for children, Unisex Staff toilet, Cleaner’s Room.

### Essential Functional Areas and Functional Units for K–6

- Learning Neighbourhoods within Learning Community areas.
- Facilities within each of the Learning Communities to support the learning of students with disability.
- Teacher workspaces as an integral component of the Learning Neighbourhoods/Learning Communities.
- Facilities for the Arts:
  - Performing Arts—learning, creative expression and performance in dance, drama and music;
  - Visual Art – learning to create and display in 2D and 3D; and
  - Media Arts – engaging with communications technologies and cross-disciplinary art forms to design, produce, distribute and interact with a range of print, audio, screen-based or hybrid artworks.
    - Facilities to support learning in Science – active investigation and inquiry.
    - Facilities to support Design and Technologies and Digital Technologies– engagement in designing, creating and evaluating using a range of materials.
    - Health and Physical Education in indoor (gym) and outdoor areas (sports field and hard courts).
    - Facilities to support learning with digital technology area—green screen, media, broadcasting (proximate to arts, dance, drama and/or distributed through learning communities).
    - External learning environments and play areas, outdoor presentation and performance setting(s).
    - Productive garden and/or other garden/horticulture area with potential to include a Community Garden.
    - Social and recreational areas for students, staff and parents.
    - Canteen.
    - Student and staff amenities.

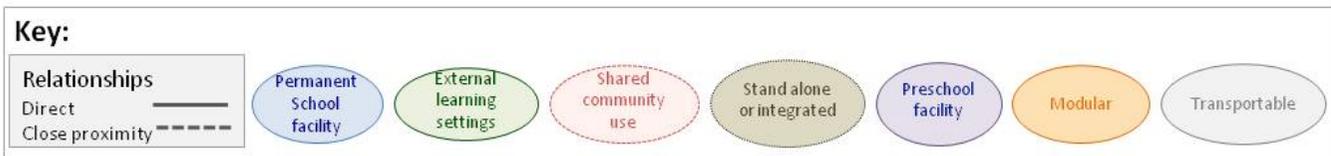
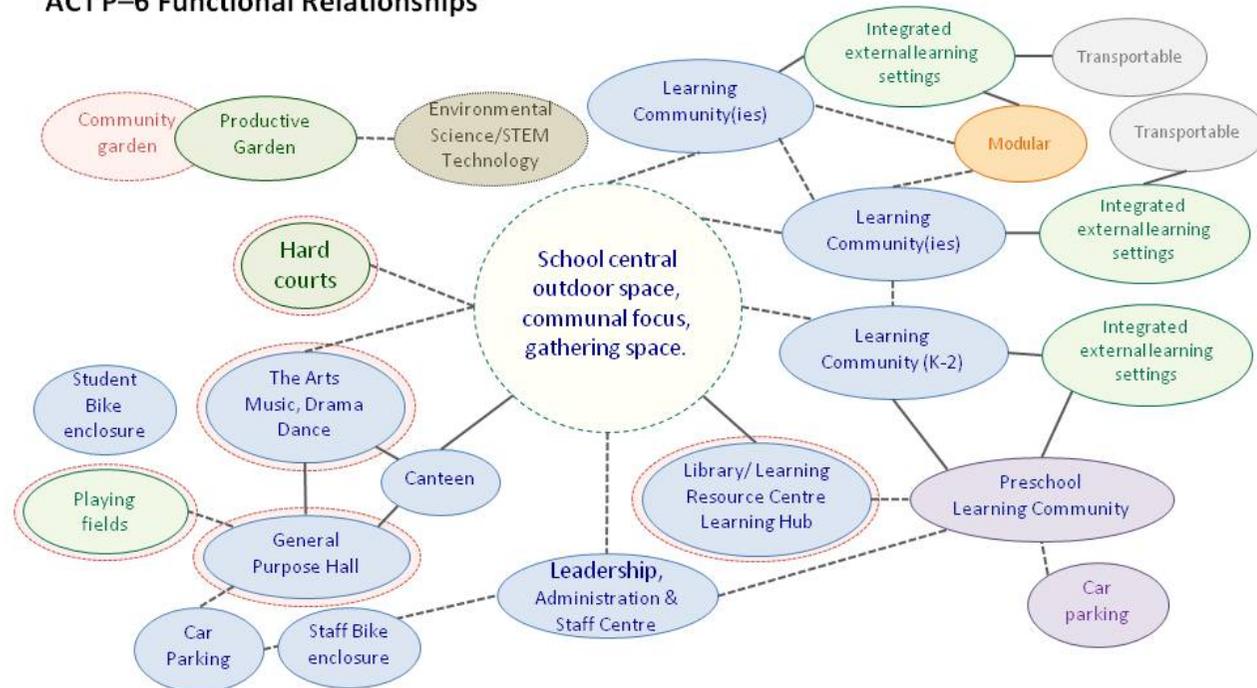
School facilities will also be used for before and after school care.

### 6.5 Functional relationships for Preschool – Year 6

Figure 6 gives an indication of desirable relationships between the Functional Areas for a Preschool–Year 6 School and the relationship of Functional Areas for Preschool and Primary School to the Site as a whole.

Figure 6: Preschool–Year 6 Functional Relationships

ACTP–6 Functional Relationships



It is essential that the layout of the site, during the masterplanning process, addresses the preferred Functional Relationships shown in Figure 6. Given the unique nature of each school site, it is possible that desired relationships might at times compete. **When this occurs, designers are required to consider all options and present the positives and negatives of each option.**

## 7 Detailed Functional Specifications for a P–6 School

### 7.1 General information

#### Preschool integration versus co-location

The integration of preschool as an integral part of the school requires that the physical design convey integration and connectedness while also conveying the special character of the preschool as an early childhood education setting.

#### Contemporary learning environments for students and staff

Just as contemporary work places are no longer simply based on a room-based structure, equally primary school learning environments are no longer structured around a room-based structure where one teacher directs the learning of 20–25 students. As outlined in Section 3.8, contemporary learning requires learning environments that support:

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

While the move away from the ‘single cell’ model gives greater opportunity for innovative design responses, there are greater challenges for the designers. 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 pattern of use, efficiency of staffing, safety and security;
- the function of each area as described in this Functional Brief;
- taking note of the specific functional requirements for each learning setting; and
- integrating the functional specifications and requirements with the *Technical Specifications* and providing a *Furniture, Fitout and Equipment* schedule that activates each room or space as required to achieve the function(s).

### 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;
- indicative area allocation;
- general overview of function;
- Functional Units that make up the Functional Area;
- operational factors to consider; and
- 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;
- indicative area allocation and area guidelines;

- design intent;
- operational factors to consider;
- general functional requirements; and
- specific functional requirements in terms of spatial layout, fit out, acoustics, visibility, ICT, security etc. with reference to related sections of the Output 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.

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

## 7.2 Functional Specifications for the whole school use facilities

### Leadership, Administration and Staff Centre Functional Area

<b>SCHOOL SECTION:</b>	Whole School		
<b>FUNCTIONAL AREA</b>	LEADERSHIP, ADMINISTRATION AND STAFF CENTRE		
<b>LOCATION:</b>	School entry point: a component of a community precinct or a community access zone		
<b>Indicative Area:</b>	Permanent buildings provided for a primary school enrolment:	<b>450</b>	<b>600</b>
	Indicative Area permanent building—m <sup>2</sup>	392	468
<b>Amenities:</b>	Cleaners store, Toilets [as per WHS requirements]		
<b>Administration Staff:</b>	General Office Staff [Number is an individual school-based decision] and Facilities Management personnel	1-3	2-4
	Business Manager	1	1
<b>Leadership Staff</b>	Principal and leadership team	3 [minimum]	5 [minimum]

#### Overview

The Leadership, Administration and Staff Centre acts as the central focal point for the public as well as student and parent reception, leadership, management, administration and communication. 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 considered to provide 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. It might be desirable in large schools, for example, to provide leadership areas in Learning Communities to distribute the leadership presence through the school.

#### Functional Units in the Leadership, Administration and Staff Centre

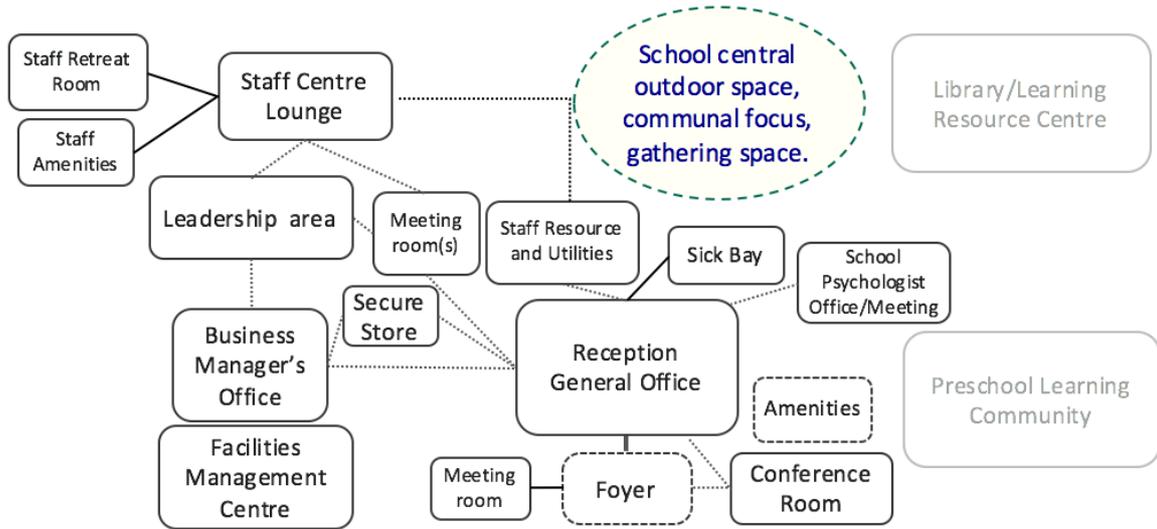
- Reception and General Office (including air-lock and waiting area).
- Leadership area.
- Business Manager's Office.
- Secure Store.
- Uniform Store.
- Sick Bay and DA compliant accessible student toilet.
- Meeting spaces: Interview/Meeting Room, Conference/Board Room, Counsellor's Meeting Room.
- Staff Centre/Lounge.
- Staff Retreat Room.
- Staff Resource and Utilities area.
- Facilities Management Centre.
- Amenities: Accessible/Visitor's toilet, Staff Toilets/Shower/Change Room, Cleaner's Room.

#### Operational factors to consider

The Leadership, Administration and Staff Centre can be intensely busy at specific peak times—just before school starts, at breaks and from just before to shortly after the school's finishing time. Way finding and ease of flow of people in and out of this functional area and within the area is an important factor to consider. Narrow corridors are to be avoided.

Cleaners' rooms must be distributed across the facilities to satisfy operational, storage and Work Health and Safety (WHS) requirements. A bulk cleaners store should be considered.

**Functional relationships Leadership, Administration and Staff Centre**



**Key:**

Relationships	
Direct	—————
Close proximity	.....

Area allocated

Allocate internal travel area

Nearby Functional Area

<b>FUNCTIONAL UNIT:</b>	<b>Reception and General Office</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for a primary school enrolment:	<b>450</b>	<b>600</b>
	m <sup>2</sup> [Area for foyer and waiting to be allocated from internal travel]	40	50

### Design Intent

The Reception area and General Office are the first point of contact for parents and visitors and 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 separate waiting area for students;
- a waiting area for parents, visitors and tradespersons;
- registration and admission of school visitors and tradespersons; and
- receiving deliveries.

The General Office is the administrative hub for the school. It supports a range of administrative functions including, filing, printing, compiling, recording and computing.

### Operational factors to consider

At peak times, the staff in the general office can be extremely busy responding to a range of school operational and administration functions and coordinating processes such as collection of money, processing student absences, 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.

### 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;
- be accessible to the general public without adversely affecting the security of the school;
- include a foyer area that provides an air-lock and waiting space for up to six–eight 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 parents, visitors or students while still providing clear access to the internal circulation network via a security door controlled from the general office and by key;
- 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; and
- be located near the Principal's work area but not necessarily directly accessed from it.

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, recording and storing; and
- administrative staff working as a team and/or individually at workstations which afford some privacy from visitors and students.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> 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</p> <p><b>Visibility:</b> Reception staff readily visible from school access area and school main entry and vice versa</p>	<p><b>Acoustics: [Refer to Technical Specification]</b> 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</p> <p><b>ICT: [Refer to Technical Specification]</b> 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 Distributed power and data to service works stations Wireless access throughout foyer and reception to allow for</p>
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<p>Abundant natural light, control of glare and direct sunlight</p> <p><b>Fitout:</b></p> <p>Seating for 4-5 in visitors in waiting area</p> <p>Flat surface for form completion in waiting area</p> <p>Seating in student waiting area</p> <p>Clearly identifiable reception counters of appropriate height for parents/visitors, students and wheelchair access [Refer Technical Specification]</p> <p>Workstations for the number of administration staff – consider a mix of standing and desk height</p> <p>Deep bench area for collating, compiling</p> <p>Open shelf storage—under bench and overhead</p> <p>Closed full height storage including some lockable storage</p> <p>Height adjustable, swivel office chairs for each General Office staff member plus additional seating for working meetings with other staff members</p> <p>Display boards, display cabinet in foyer/waiting area</p> <p>Display boards in General Office</p> <p>Whiteboard or writeable surface for group planning</p> <p>Information display</p> <p>Clock readily visible throughout the office space</p>	<p>changing layouts and flexibility.</p> <p><b>Security: [Refer Technical Specification]</b></p> <p>Consider security of Reception Staff; and</p> <p>Secure service counter including lockable cash drawer</p>
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*Note: The design for the Reception area **must be signed off by the EDU WHS advisor** to ensure minimum level of security is achieved.*

<b>FUNCTIONAL UNIT:</b>	<b>Secure Store</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	25	28

### Design Intent

The General Office Secure Store is for general and archival storage purposes, including the storage of confidential material such as student records.

### Operational factors to consider

The Secure Store 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.

### Functional requirements

The Secure 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; and
- be fire rated.

<p><b>Specific Functional requirements</b></p> <p><b>Spatial layout:</b> Ensure ease of access to all shelving and storage</p> <p><b>Visibility:</b> Zero visibility into the room Items in storage cabinets, compactus, shelves clearly visible Lighting to ensure visibility in all areas of the room</p> <p><b>Fitout:</b> Solid core fire rated door adjustable shelving Filing cabinets Compactus and safe (lockable)</p>	<p><b>Acoustics: N/A</b></p> <p><b>ICT:</b> Wireless coverage Data points</p> <p><b>Security:</b> Refer Technical Specification Lockable door</p> <p><b>Fire systems:</b> Fire rated door [Refer Technical Specification]</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Uniform Storage</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>580</b>
	m <sup>2</sup>	4	6

### Design Intent

The Uniform Storage is for storage of school uniforms for sale. Associated display manikins can be located in the General Office or Foyer.

### Operational factors to consider

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

### Functional requirements

The Uniform Storage is required to:

- be located close to, and easily accessible from the General Office; and
- store all items of uniform organised by item and size.

<p><b>Specific Functional requirements</b></p> <p><b>Spatial layout:</b> Ensure ease of access to all shelving</p> <p><b>Visibility:</b> Ensure visibility of all shelves and areas of storage; and Items clearly visible on open shelves</p> <p><b>Fitout:</b> Full height adjustable shelving with hanging racks for clothes</p>	<p><b>Acoustics: N/A</b></p> <p><b>ICT:</b> Wireless coverage</p> <p><b>Security: [Refer Technical Specification]</b> Lockable door(s)</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Business Manager's Office</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	12	12

### 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 close to, and easily accessible from the Principal's Office and the General 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; and
- provide visual privacy when required.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Ensure ease of movement between different work areas Ensure ease of access to all shelving and storage</p> <p><b>Visibility:</b> Abundant natural light visual connectedness to adjacent circulation area capacity to provide visual privacy when required</p> <p><b>Fitout:</b> a desk/workspace for a desktop computer as well as adjacent paperwork a height adjustable, swivel office chair open shelving to hold folders vertically lockable cupboard or cabinet filing cabinets seating for two-three people plus the Business Manager coffee table display</p>	<p><b>Acoustics: [Refer Technical Specification]</b> capable of acoustic isolation when doors and windows are closed</p> <p><b>ICT:</b> power and data to service work station wireless coverage</p> <p><b>Security: [Refer Technical Specification]</b> secure room</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Leadership Area</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	Executive Leadership Team		
	Total area for Executive Leadership Team (m <sup>2</sup> )	44	68

## Design Intent

The Leadership Area provides a central leadership zone that feels connected to, not remote from, the learning activity and learning areas of the school while being closely connected to the Administration Area and Staff Centre for efficiency of communication and access.

The Leadership Area includes work areas for the Principal, Deputy Principal(s) and School Leaders. 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; and
- administrative activities including school organisation and planning, the writing of reports and other documentation.

Support for these functions can be provided in a number of ways using a combination of discrete and open settings. Functionally, this requires a combination of open and closed spaces that can be used as individual work areas, collaborative work areas, plus small and medium sized private meeting rooms.

Schools have a range of approaches to the use of the Leadership Area depending on their leadership philosophies and models. Three different operational styles can be adopted.

A highly collaborative leadership models with a shared workspace with direct access to two meeting rooms of different sizes that can be used for private meetings and/or collaborative planning.

A separate Principal's Office with adjacent collaborative team space for Deputy Principal(s) and School Leaders that has direct access to a smaller meeting room.

Separate offices for all members of the executive leadership team with meetings held in available meeting rooms.

**This requires a design solution that fits any of the three models or is able to be readily reconfigured to do so.** For example, a room may be used as a Principal's Office in one school but in another the same room is used as a large meeting/conference room. 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 (larger meeting room in model 1 above or the Principal's office in models 2 or 3) 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:

- 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 range of various sized meeting spaces;
- be fitted out to support individual work desks/ work stations as well small and medium sized areas that can be used for private meetings and/or collaborative design and planning sessions as a leadership team or with staff groups;
- storage for individual work related documents resources;
- secure storage for personal belongings;

- storage for resources used by the leadership team; and
- a student waiting area.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> enable ease of movement between individual and team collaborative work areas and meeting spaces</p> <p><b>Visibility:</b> a degree of visibility into the leadership work area(s) while maintaining the capacity for privacy and security abundant natural light, control of glare and direct sunlight</p> <p><b>Acoustics: [Refer Technical Specification]</b> closed spaces that will be used for private meetings require acoustic isolation collaborative spaces require the capability of containment of distracting sound into/out of the space while maintaining ease of flow between spaces.</p>	<p><b>Fitout:</b> display areas – noticeboard, whiteboard and/or a writeable surface appropriate to the function of each space 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 and overhead closed full height storage including some lockable storage height adjustable, swivel office chairs for each leader a range of coffee tables, meeting tables appropriate to the design seating for meeting spaces—combination of comfortable lounge type chairs and office chairs appropriate to the design display boards, display cabinet, AV screen in foyer/waiting area clocks as required to provide visibility throughout the Leadership Area</p> <p><b>ICT: [Refer Technical Specification]</b> 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 Security: [Refer Technical Specification]</p>
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**Note: The final detailing and fit out of the Leadership Area must be completed in collaboration with the inaugural Principal.**

<b>FUNCTIONAL UNIT:</b>	<b>Conference/Meeting Room</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	30	30

### Design Intent

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

- the school staff and students including Preschool staff;
- the School Board, P&C and parent groups;
- members of the community for shared community use;
- by school staff and visitors for meetings and professional learning; and
- virtual conferencing.

### Operational factors to consider

Given that the Conference/Meeting Room will be used by:

- the Preschool staff and parents, it is important that it be readily accessible from the Preschool entry; and
- the School Board/P&C and the community out of school hours, it is important that access can be gained to the Conference/Meeting Room without the need to enter the main secured area of the school.

### Functional requirements

The location, layout and fit out of the Conference/Meeting 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 secure storage for all AV and other equipment that could be required in the room to serve its different purposes; and
- be proximate to a space that is equipped to serve refreshments and food that has been pre-prepared.

#### 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

a wide rectangular room (and table fit out) is preferable to enhance communication

##### Visibility:

a degree of visibility into and out of the Conference/Meeting Room while maintaining the capacity for privacy and security  
abundant natural light, control of glare and direct sunlight  
controllable lighting

##### Acoustics: [Refer Technical Specification]

capable of acoustic isolation with doors and windows closed

##### Fitout:

an oval or round-end wide rectangular meeting table to seat 12-15 people

height adjustable, swivel office chairs to suit the table  
display areas – noticeboard, whiteboard and/or a writeable surface

kitchenette bench, sink, beverage point and storage that can be closed off from the space

a beverage point with a bench top, sink, boiling and chilled water, upright fridge and micro-wave oven  
storage—under bench and overhead

(If the functional requirement for serving of pre-prepared food and beverages is located in the Conference Room)

##### ICT: [Refer Technical Specification]

backbone infrastructure to support multi-media presentations and video conferencing

interactive AV display screen appropriate to depth of the viewing area and legible from all positions in the room

phone data point MATV

##### Security: [Refer Technical Specification]

<b>FUNCTIONAL UNIT:</b>	<b>School Psychologist's Office/Meeting Room and waiting area</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	15	15

### Design Intent

The School Psychologist's Office/Meeting Room is a private space for a School Psychologist to meet with up to five people for private discussions, write up reports and store files and resources. It will be used for confidential meetings and for counselling students or staff. The atmosphere of the adjacent waiting area and room is required to be welcoming and inviting, not threatening.

### Operational factors to consider

Students and staff generally need a degree of privacy when visiting the School Psychologist. The waiting area and entrance to the room should be relatively private, while still being discretely observable from the General Office.

### Functional requirements

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

- be located near, but not directly connected to the General Office;
- have a welcoming, inclusive but private feel;
- accommodate up to five people (adults and children) seated comfortably;
- include a small desk, lockable filing cabinet and storage space; and
- provide secure storage for personal belongings.

#### Specific functional requirements

##### Spatial layout:

waiting area slightly removed from entry  
sufficient space between the work desk and small meeting setting for flow between the areas  
provide personal space for five individuals without either overcrowding nor creating an 'empty' feel

##### 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

##### Acoustics: [Refer Technical Specification]

complete acoustic isolation to ensure privacy and confidentiality.

#### Fitout:

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  
seating in the waiting area  
displays, books, magazines, activities for students, parents and/or staff waiting

#### ICT: [Refer Technical Specification]

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

#### Security: [Refer Technical Specification]

duress alarm

<b>FUNCTIONAL UNIT:</b>	<b>Interview Rooms/ Meeting Spaces</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	Number of interview/meeting rooms	2	3
	m <sup>2</sup>	22	34

### Design Intent

The Interview Rooms/Meeting space(s) will be used for multiple purposes. They can serve as a general meeting space for teaching teams, a space for leaders to work with teaching teams, a space where staff can hold interviews with parents and students and a space of the foyer to meet visiting suppliers on entry.

### 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 Interview/ Meeting Spaces is required to provide:

- a meeting space to accommodate up to 4 people close to the front foyer that can be accessed without entering the secure area of the school;
- meeting space(s) accommodate up to 6 people located proximate to the leadership area and to the School central outdoor space; and
- adaptable to function as a working meeting space or an interview space, that is, either seated at a meeting table or a small relaxed coffee table setting.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> sufficient space to rearrange the furniture to suit the various functions—a meeting table setting or a small relaxed meeting setting</p> <p><b>Visibility:</b> a degree of visibility into and out of the Interview/ Meeting Rooms while maintaining the capacity for privacy and security abundant natural light, control of glare and direct sunlight controllable lighting</p> <p><b>Acoustics: [Refer Technical Specification]</b> complete acoustic isolation to ensure privacy and confidentiality</p>	<p><b>Fitout:</b> meeting table to suit intended group size(s) office chairs appropriate to the meeting table meeting setting to seat four or six people according to room size display boards for posters, information resources whiteboard or writeable surface</p> <p><b>ICT: [Refer Technical Specification]</b> power and ICT connectivity for mobile and fixed computing devices and telecommunication</p> <p><b>Security: N/A</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Staff Lounge</b> With adjoining adaptable space for use as a Professional Learning Centre or accommodate increased staff numbers at peak enrolment		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for a P–6 enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	80	95

### Design Intent

The Staff Lounge provides a central relaxation and social gathering space for all school staff and is an important functional area for building a whole-school culture. It is intended to be used at break times, before and after school and as a retreat space for relaxation. It can also be used for planning meetings during the school day and the adjoining adaptable space is intended to be used as a Professional Learning Centre when not required as an extension of the Staff Lounge at peak enrolment.

**Opportunity:** to provide an adaptable space, connected to the Staff Lounge by an operable wall that can serve as a Professional Learning Centre at Long Term Enrolment figures or as a larger Staff Lounge space at peak enrolment.

### Operational factors to consider

With the move to integrate staff work areas into the Learning Communities and the sharing of school information via email, there has been a tendency for teachers to spend most of their time in the Learning Communities. This can lead to a reduction in a whole-school culture and an unintentional division between administration and teaching staff. Many schools develop 'soft systems' such as special morning teas, and special events days to provide a reason for teachers to go to the Staff Lounge. In addition to these 'soft systems' it is important to consider functionalities that could be integrated with the Staff Lounge to give teachers a reason to visit the area on a regular basis – for example a Professional Learning Centre that houses resources, large displays of the school's strategic plan, student data etc.

### Functional requirements

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

- be located centrally to provide ready access from the Learning Communities;
- have at least a partial view to external play spaces to allow for observation of playground areas;
- 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 peak enrolment staff numbers;
- have restricted public access;
- provide a welcoming, relaxed environment;
- have access to a shaded, external courtyard; and
- include a kitchen area sized to serve the staff numbers at peak times during the day (morning break and lunch time) and other facilities for casual use by staff.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> 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</p> <p><b>Visibility:</b> A view to an outside courtyard, landscaped area or feature view Abundant natural light, control of glare and direct sunlight controllable lighting If practicable, have at least a partial view to external play spaces to allow for incidental supervision of students Acoustics: [Refer Technical Specification] capability to contain distracting sound into/out of the space</p> <p><b>ICT: [Refer Technical Specification]</b> AV display screen or equivalent visible and legible from all positions in the room MATV</p> <p><b>Security: [Refer Technical Specification]</b></p>	<p><b>Fitout:</b> Several small settings of comfortable lounge chairs/coffee tables A variety of bench areas such as standing height benches, large 'kitchen bench' Multiple refrigerators (consistent with Long Term Enrolment staff numbers) for storage of staff lunches and snacks, milk and beverages, food platters for staff functions 2 microwaves placed at bench top level An upright stove or wall oven, cooktop and range hood 2 dishwashing machines Space against a wall in the staff lounge for separate refrigerated beverage and snack vending machines (school choice to install) Adequate bench space and storage space for supplies, and all necessary kitchenware Minimum of 2 boiling and chilled water dispensers A minimum of two separate one bowl/two drainers stainless steel sinks Large noticeboards for display of school planning calendar, professional learning items, school development displays Whiteboard functionality—fixed whiteboard or writeable wall rack of named pigeon holes (larger than A4 width) for delivery of mail and messages to staff; sufficient numbers to provide for peak enrolment [Refer Technical Specification and FF&amp;E] Lockers for visiting and relief staff [Refer FF&amp;E]</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Staff Resource and Utilities</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	20	25

### Design Intent

The Staff Resource and Utilities area is used by teachers and office staff to print materials, prepare communication and learning resources including laminating posters, documents and teaching aids. It is also used for the centralised storage of stationery and printer/photocopier consumables.

The Staff Resource and Utilities area acts as a central location in the Leadership, Administration and Staff Centre area for paper recycling and safe disposal of electronic equipment and batteries.

### 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.

Although open access is desirable, consideration needs to be given to machinery and production sound intruding into surrounding spaces.

### Functional requirements

The location, layout and fit out is required to:

- be located near, and easily accessible from the General Office and the Staff Lounge;
- efficient use of space for unobstructed circulation and access to photocopiers (MFD), storage, photocopier, printers, work benches, recycling bins; and
- provide extensive, accessible storage – both under and over – bench tops for various stationery items, different paper and cardboard size.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Layout and room shape designed to facilitate several people involved in printing and production activity, accessing storage</p> <p><b>Visibility:</b> Bright light to all work areas stored items readily visible</p> <p><b>Acoustics: [Refer Technical Specification]</b> Containment of sound out of the space</p> <p><b>ICT: [Technical Specification]</b> Data/power outlets Security: [Refer Technical Specification] Secure cupboards for bulk stationery</p>	<p><b>Fitout and equipment:</b> 2 x multifunctional printer, copier, scanner, fax with co-located ceiling exhaust extraction system shredder laminator binder guillotine paper recycling wheelie bin storage for used cartridges safe disposal container(s) for batteries and electronic equipment an extended, deep horizontal work space suitable for the production, layout, cutting, laminating and binding of printed materials an adjustable height work surface with open space below a large noticeboard/display board behind the multifunction printer and over bench tops open storage area for frequently used supplies–paper, cardboard extensive secure bulk storage for a range of stationery supplies lockable storage cabinet for supplies of pens, special items key safe</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Sick Bay and Student Toilet (acc. change, shower, toilet)</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	40	40

### Design Intent

The Sick Bay serves as a base for administering First Aid and as a rest room for sick students.

### 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 parking bay.

### Functional requirements

The Sick Bay is required to:

- be located close to, and be readily supervised and accessed from the General Office;
- accommodate two students;
- provide a degree of privacy for individual students using the Sick Bay;
- provide a triage area; and
- be proximate to a DDA compliant disabled toilet and a disabled change room/shower which is directly accessible from the First Aid Room main area.

Disabled and visitor toilets are to be unisex.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Ensure ease of access to all areas of the sick bay to attend to sick students Ensure space for manoeuvring a wheel chair</p> <p><b>Visibility:</b> Controllable natural light to main Sick Bay area Direct line of sight supervision from the General Office</p> <p><b>Acoustics: [Technical Specification]</b> Capable of being acoustically contained/separated</p>	<p><b>Fitout:</b> one appropriately cleanable domestic bed seating for 2 students 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 under recess for small bar fridge, tiled splashback over bench top, matching length overhead cupboards – lockable under bench lockable bar fridge with small integral freezer soap and paper towel dispensers medical waste's and sharps containers entry door not lockable display board and white board vinyl flooring</p> <p><b>ICT: [Refer Technical Specification]</b> wireless coverage</p> <p><b>Security:</b> Sick Bay room door not lockable First Aid cabinet lockable</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Staff Retreat Room</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	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 the different intents 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; and
- include storage for First Aid equipment and supplies.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Ensure space for manoeuvring a wheel chair</p> <p><b>Visibility:</b> Controllable natural light Viewing panel from outside with visibility control Signage indicating occupation or vacancy Acoustics: [Refer Technical Specification] Able to be acoustically contained/separated</p>	<p><b>Fitout: [Refer Technical Specification]</b> 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's and sharps containers bench top suitable for nappy change under bench bar fridge with small integral freezer entry door not lockable carpet plus vinyl flooring in wet area</p> <p><b>ICT: N/A</b></p> <p><b>Security:</b> Door not lockable First Aid cabinet lockable</p>
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<b>AMENITY:</b>	<b>Staff Toilets (Male and Female), Change room, Shower</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	See 5.5.4 for toilet requirements		

### Design Intent

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

### Operational factors to consider

The ratio of male to female staff in ACT schools is approximately 1:5. 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 should also be given to distributing staff toilets around the Learning Communities and/or staff use of DDA compliant toilets included in each Learning Community.

Locating the staff showers within the Leadership, Administration and Staff Centre ensures a central location and provides a reason for teaching staff to frequent the Staff Centre.

### Opportunity

There is an opportunity to consider individual staff toilets as a means of providing equitable access.

If this approach is taken, two toilets would be required to have integrated shower and change

### Functional requirements

The Staff Toilets are required to:

- be provided in compliance with BCA requirements (this will not be enough toilets at peak times – recess and lunch); and
- be located adjacent to and be readily accessible from the Staff Lounge.

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

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

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> 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.</p> <p><b>Visibility:</b> 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 Centre/ Lounge.</p> <p><b>Acoustics: [Refer Technical Specification]</b> able to be acoustically contained</p>	<p><b>Fitout: [Refer Technical Specification]</b> 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 floor waste ventilation to the external air mechanical ventilation shower change area bench clothes hanging towel rack staff lockers</p> <p><b>ICT: N/A</b></p> <p><b>Security:</b> internally lockable doors</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Facilities Management Centre: Bulk Store and Office</b>		
<b>FUNCTIONAL AREA:</b>	Leadership, Administration and Staff Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	50	55

### 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 materials, chemical goods and cleaning material and serve as a maintenance workshop.

### Functional requirements

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

- accommodate heavy vehicle access;
- be located close to the Leadership, Administration and Staff Centre;
- be unobtrusive—not ‘front of house’;
- provide efficient and accessible storage; and
- provide workshop facilities.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Layout and room shape designed to create zones for office work, workshop and storage. Bulk store either directly accessible from the office/workshop zone or integrated</p> <p><b>Visibility:</b> 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 sound accordingly</p> <p><b>ICT: [Refer Technical Specification]</b> data/power</p> <p><b>Security: [Refer Technical Specification]</b> lockable external doors lockable internal storage</p>	<p><b>Fitout and equipment:</b> workstations for two people storage cabinet filing cabinet heavy duty work bench 900mmH x 900mmW x 5000mmL with open shelving under wood and metal vices workshop tools and storage wall lockable storage (~25% of all storage) adjustable open storage shelves 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 Note: Facilities can include a garden shed.</p>
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## Library/Interactive Learning Resource Centre

<b>SCHOOL SECTION:</b>	<b>Whole School – Preschool, Primary and Secondary School</b>		
<b>FUNCTIONAL AREA</b>	<b>LIBRARY/INTERACTIVE LEARNING RESOURCE CENTRE</b>		
<b>LOCATION:</b>	Central to whole school—Preschool, Primary and Main Entry		
<b>Indicative Area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	270	320

**NOTE:** In addition to the Library/Interactive Learning Resource Centre, similar functionality is required in each of the Learning Neighbourhoods and Learning Communities to facilitate ease of access to age/stage/Learning Area related resources and equipment that is shared by the whole Learning Neighbourhood and/or Learning Community. While not compromising the functionalities required for the main Library/Interactive Learning Centre, a proportion of the total area allocated to Library/Interactive Learning Resource Centre functionality should be distributed to the Learning Communities.

## Overview

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

A 'library' in a contemporary school is not the traditional 'book repository' of bygone times. It is more akin to the 'living room' of a house — a whole-school use space where students of all ages gather to create and share their own knowledge, work on team projects and engage in extended learning events. The library is also used for presentations of projects by students, learning events such as an extended project or inquiry for which the main area might be set up as a living museum, gallery or workshop space. As an example, a school set up the main area of the library as a space in which a group of students recreated a setting from the Ballarat goldfields and once they had set it up and re-enacted the Eureka Stockade they ran mini learning events for other groups of students. The Library/Interactive Learning Resource Centre is also still used for reading and storytelling, board and computer games, meetings, seminars and for accessing, and learning to use, a variety of text and media resources that assist learning.

## Design Intent

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

- access and engage with general learning resources that need to be available to the whole school community (including books, charts, multimedia, indoor games, ICT etc.);
- provide a reflective space and atmosphere for research, reading and stimulating the imagination;
- interact in knowledge creation, expression and sharing;
- obtain assistance in 'knowledge navigation' and information about learning resources;
- hold learning 'events', meetings and gatherings of small, medium, large and very large groups of students, teachers, student leaders, parents/carers, clubs, interest groups;
- engage in games—virtual and board games; and
- engage in virtual conferencing.

**Opportunity:** An opportunity exists to promote integration between the Preschool and Primary School and to develop partnership with parents by providing an area that can be used for Preschool reading/storytelling. This setting could potentially be used by a parent organised reading groups, Preschool age children mixing with Foundation for reading sessions, older children reading to younger children.

## Operational factors to consider

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

Not all schools have a dedicated Librarian. Therefore, it cannot be assumed that the Library will be supervised by Staff at all times. This needs to be considered in the design and layout of the Library/Interactive Learning Centre and the provision of secure storage area(s).

Libraries can be used for out-of-school-hours school events as well as community use. 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.

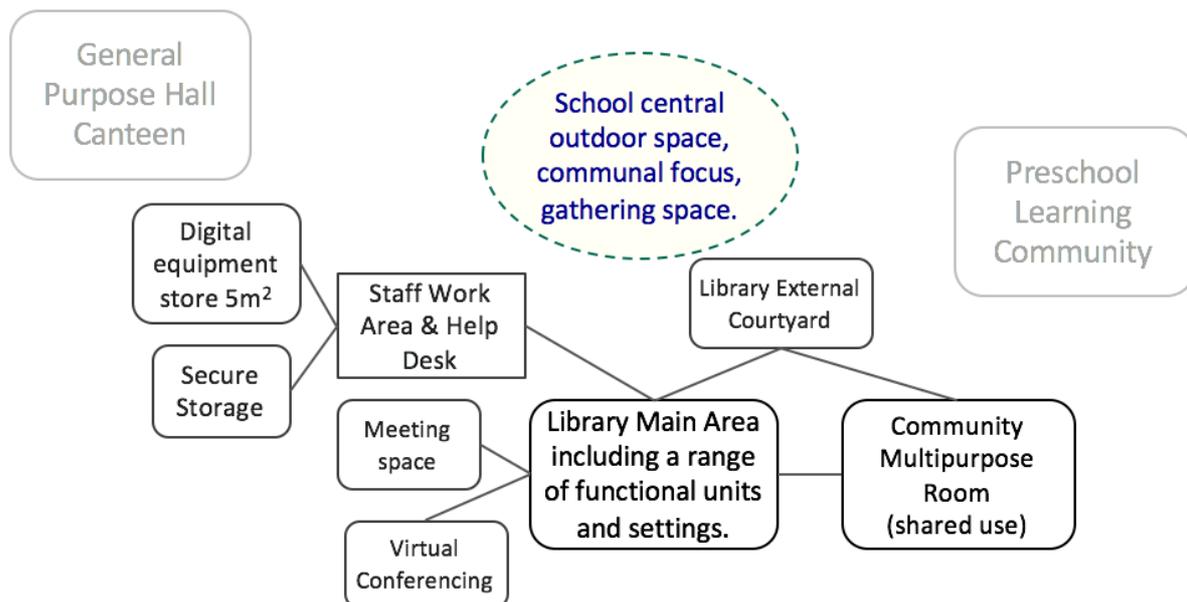
The Community Multipurpose Room, which is an integral Functional Unit of a Canberra Public school, serves many school and community functions. Within and outside school hours, it can serve both community and school needs for meetings, education events for the community, professional learning and student learning activities.

## Functional Units – Library/Interactive Learning Resource Centre

- Staff work area and circulation/help desk.
- Presentation and explicit teaching setting(s) for use by small, medium, large and very large groups of students, staff and community.
- Quiet, comfortable settings for reading—individual and reading circle.
- Reflective settings for thinking, reading and research.
- Settings for small collaborative groups around tables.
- Settings for pairs, small groups collaborating around an AV display.
- External shaded courtyard with comfortable learning settings for quiet reading, conversations, informal meetings.
- 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.
- Secure storage for AV equipment.
- Meeting room.
- Community Multipurpose Room.
- Community toilets and facilities.
- Community storage areas.
- Acoustically contained, virtual conferencing setting.
- Store rooms.
- Readily accessible student and staff amenities (if the Library is a standalone building additional amenities, including a DDA compliant toilet, are required).

## Functional relationships – Library/Interactive Learning Resource Centre

### Library/Interactive Learning Resource Centre



### Key:

Relationships  
 Direct \_\_\_\_\_  
 Close proximity .....

Area allocated

Allocate travel/circulation

Nearby Functional Area

<b>FUNCTIONAL UNIT:</b>	<b>Library Staff Work Area and Secure Storage</b>		
<b>FUNCTIONAL AREA:</b>	Library/Interactive Learning Resource Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	15	15

### Design Intent

The Staff Work Area is a space to support administration related to Library resources. It can also serve as a sign out station and a help desk.

### Operational factors to consider

Many schools involve parent help in the Library, so it is possible for two or more people to be working in the Staff Work Area.

Primary school libraries generally have more of an 'open access' feel than high school or college libraries.

Security/detection gates are not necessary in P-6 schools but the Staff Work Area needs to be located so that there is good passive surveillance of the total Library area including entry and exit points.

### 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:

- an office area and work station;
- a library materials/resources work area;
- a service counter which serves as help desk and for signing out and returning library resources;
- general storage for equipment and materials needed for Library administration and management; and
- secure storage cabinets to house valuable equipment such as AV and IT 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: N/A

##### ICT: [Refer Technical Specification]

power/data point for desktop computer

Security: [Refer Technical Specification]

#### Fitout:

work bench with storage under for library resources counter  
full height lockable cupboard with adjustable shelving  
work station 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 shut and bin.  
Collating table

<b>FUNCTIONAL UNIT:</b>	<b>Library Main Area</b>		
<b>FUNCTIONAL AREA:</b>	Library/Interactive Learning Resource Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	150	200

## 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 of children and adults—individuals, small, medium, large and, by opening an operable wall connecting the main library area to the adjacent Community Multipurpose Room, very large groups of up to 150.

At times, one or two teaching staff might be working with a group of 20–50 students while several small groups are working collaboratively on a project, individuals are reading or researching, a group of Preschool children are attending a story telling session, and a group of parents are involved in a session to help them understand how to help their children with reading.

The Library can be used extensively at recess and lunchtime as a social recreation space for quiet reading, board and computer games, relaxation and retreat. At some schools, teacher librarians set up lunchtime activities – games, puzzles. Schools might also use the Library/Interactive Learning Resource Centre for student clubs—e.g. chess, science, art, debating, tech and book club.

Settings will require frequent rearrangement by children and staff 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 of students, staff and community;
- 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; and
- display and storage areas for a variety of resources—books, digital media, charts, games, student projects, wall displays 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; and
- be carefully zoned to minimise 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 small children without assistance.

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

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> as per the Functional Requirements above</p> <p><b>Visibility:</b> as per the functional requirements for each setting – Table 10</p> <p><b>Acoustics:</b> [Refer Technical Specification] as per the functional requirements for each setting</p> <p><b>Fitout:</b> loose and fixed furniture to serve the settings listed</p>	<p><b>ICT:</b> [Refer Technical Specification] data points for desktop computers/AV display fixed data projection for projection to very large groups large drop down screen or large wall with surface suitable for projection interactive display screens for small collaborative groups wireless access (WiFi)</p> <p><b>Security:</b> [Technical Specification]</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Community room / Multipurpose Room including kitchen / release space / kitchen garden / store rooms</b>		
<b>FUNCTIONAL AREA:</b>	Library/Interactive Learning Resource Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	90	90

### Design Intent

The Community Multipurpose Room is, as its name implies, a bookable space that will be used for multiple functions by the school and the wider community.

To maximise its usefulness, it should be designed to be an integrated aspect of the Library/Interactive Learning Centre that can be opened up to the Main Library Area or closed off and secured from the Library depending on need. By being able to be opened to the Main Library Area, it maximises the functionality of the space and the Library giving it the capacity to accommodate up to 150 at a Community gathering, film screening or parent information event. Depending on the actual design, it could enable the Main Library Area to be of smaller dimensions thus creating a more intimate atmosphere.

Given its role as a shared Community facility, it needs to be accessible to the Community without having to access the main area of the school and without having to have school personnel present.

Some functions held in the Community Multipurpose Room and the adjacent Library Main area will require catering.

### Opportunity

Depending on the site layout, there might be an opportunity to integrate the Community Multipurpose Room with the Productive Garden, Kitchen and STEAM/Environmental Science area to maximise the use of all facilities contained in these areas.

### Operational factors to consider

Given that the Community Room/Multipurpose Room will have varied uses. It will require different furniture settings so needs stackable, adaptable, mobile tables and chairs.

An operable wall between the two areas will need to be robust but agile to deal with frequent and regular use.

It is possible that storage will be required for several different functions and several different user groups.

Given its community-building function, direct access to an external naturally shaded courtyard is desirable.

Consideration should be given to whether an external courtyard connected to the Community Multipurpose Room can be an extension of the courtyard adjoining the Main Library Area.

### Functional requirements

The Community Multipurpose Room is required to be designed as an adaptable space that at a minimum can serve the following functions:

- professional learning events;
- community education programs, meetings and events;
- adaptable learning space for school use; and
- catering for light refreshments.

These functional requirements should be extended in line with the development of the specific design.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> adaptable to suit a variety of functions</p> <p><b>Visibility:</b> natural lighting controllable lighting</p> <p><b>Acoustics: [Refer Technical Specification]</b> prevention of sound intrusion to and from adjacent spaces</p> <p><b>ICT: [Refer Technical Specification]</b> AV data projection suitable for viewing from all areas of the room</p> <p><b>Security: [Refer Technical Specification]</b></p>	<p><b>Fitout:</b></p> <p>foldable tables and stackable chairs to seat up to 60 in groups around the tables</p> <p>Kitchenette that: can be closed off and secured from the main space stainless steel sink with draining board, hot and cold water and chilled/boiling water unit microwave oven upright domestic refrigerator</p> <p>Student Learning Kitchen/Science Laboratory: Centre preparation benches for 4 students / bench seats / two sinks with hot and cold water / utensil drawers / underbench cupboards for science equipment Benches around walls with hot plates / ovens underneath / cupboards with cooking utensils / microwaves / storage for</p>
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crockery

<b>FUNCTIONAL UNIT:</b>	<b>Meeting Room/Virtual Conferencing Space</b>		
<b>FUNCTIONAL AREA:</b>	Library/Interactive Learning Resource Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	15	15

### Design Intent

Meeting Room/Virtual Conferencing Space can be used for a general meeting space for teachers, a quiet room for focussed activities, a small explicit teaching space for a small to medium sized group of students and/or for student meetings and clubs. It can also provide a space for virtual conferencing.

### 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 Meeting Room/Virtual Conferencing Space is required to:

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

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> 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</p> <p><b>Visibility:</b> line of sight supervision from the Main Library Area controllable lighting for video conferencing and AV presentations</p> <p><b>Acoustics: [Refer Technical Specification]</b> complete acoustic isolation for effective communication online and to prevent sound intrusion into the adjacent space(s)</p>	<p><b>Fitout:</b> meeting table office chairs appropriate to the meeting table display board whiteboard or writeable surface</p> <p><b>ICT: [Refer Technical Specification]</b> AV display equipped for virtual conferencing equipment</p> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>External Library Courtyard</b>		
<b>FUNCTIONAL AREA:</b>	Library/Interactive Learning Resource Centre		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	40	40

### Design Intent

The Library Courtyard provides an extension of the Main Library Area for reading, reading circles, and conversation. It also serves to provide a view on to a landscaped area from within the Main Library Area.

### Operational factors to consider

During school hours the courtyard needs to be readily accessible from, and visually connected to, the Main Library Area. If it is designed to be used out of school hours, consideration would need to be given to ensuring the courtyard area can be secured to prevent access to other areas of the school.

### Functional requirements

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

- be located adjacent to, and be directly accessible from the Main Library Area;
- provide settings for individual, small group and medium sized group conversation and reading;
- be landscaped to provide a pleasant vista from inside the Main Library Area and natural shade;
- able to be accessed from external areas for maintenance purposes; and
- be comfortable for use throughout the seasons.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> sufficient space to allow configuration of settings for different sized groups a large opening between the library and courtyard to allow easy access for groups of students to move through quickly</p> <p><b>Visibility:</b> line of sight supervision from the Main Library Area</p> <p><b>Acoustics:</b> N/A</p>	<p><b>Fitout:</b> a combination of fixed and mobile seating and tables that can be configured to suit use where level changes occur configure to provide integrated fixed seating area shaded naturally a combination of free standing walls/screens and planting that define the space and provide wind breaks use materials that absorb and radiate heat during winter</p> <p><b>ICT: [Refer Technical Specification]</b> Wireless connectivity Wi Fi coverage</p> <p><b>Security: [Refer Technical Specification]</b></p>
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## 7.3 Preschool Learning Community

<b>SCHOOL SECTION:</b>	<b>Preschool</b>		
<b>FUNCTIONAL AREA:</b>	<b>PRESCHOOL LEARNING COMMUNITY</b>		
<b>LOCATION:</b>	Readily accessible from the main entry and Preschool car park		
<b>Indicative Area:</b>	Permanent buildings provided for number of child places: Group size =22 for 15hrs/week – half the total time. Enrolment 88 is equivalent to 44 students in any one session = 2 groups	<b>88</b>	<b>132</b>
	m <sup>2</sup> [plus additional area provision to contain engineering and circulation functions based on the Contractor's design]	332	468
<b>Amenities:</b>	See 5.5.4		
<b>Staffing:</b>	From January 2016 staffing ration is 1:11 for Preschool	4	6

### Overview

Since 2008, Preschools in Canberra are operated as an integral part of a P–6 or P–10 school. The early childhood educators work as part of the early childhood (P–2) team. The significant advantage gained by the Preschool Learning Community being an integral part of the school is that transition from Preschool to school is seamless. Preschool age children can take advantage of the Library/Interactive Learning Resource Centre, the General Purpose Hall and other school facilities as required. While presenting physically as an integrated component of the school it is also important the Preschool Learning Community conveys its own special character.

Play is a crucial medium for learning. Through play children:

- develop an understanding of their world and develop confidence;
- explore, imagine, problem solve, practice and create;
- follow their innate curiosity;
- develop their imaginative powers and create images of what is possible;
- practise and rehearse a range of physical, emotional and social skills; and
- learn the consequences of their actions.

Both the internal and external environments of the Preschool Learning Community provide rich play/learning opportunities and experiences.

### Functional Units

- Entrance area and Interview/Meeting Room.
- Preschool Play Rooms.
- Quiet activities areas.
- Kitchen and Kitchenette.
- Store room.
- External learning environments/play areas and garden.
- Equipment stores.
- Workspace for Preschool staff that fosters collaboration.
- Amenities—Accessible toilet for children, Unisex Staff toilet, Parent and adult visitor toilet with nappy change facility, Cleaner's Room.

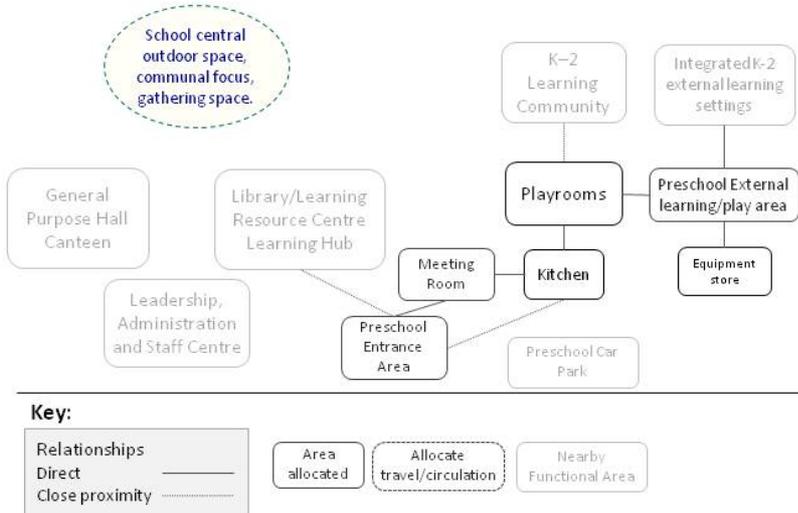
### Operational factors to consider

The Leadership, Administration and Staff Centre is essentially the 'one-stop shop' for the whole school, that is, including the Preschool. The entry to the Preschool must be in close proximity to the main entrance yet be accessed without having to go passed 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.

While the outdoor learning and play area for Preschool is required to be fenced, ready access to the K–2 external learning and play area is required to enable transition between the two.

Functional Relationships for the Preschool Learning Community

Preschool Learning Community



<b>FUNCTIONAL UNIT:</b>	<b>Preschool entrance area and Interview/Meeting Room</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of places	88	132
	m <sup>2</sup>	25	30

### Design Intent

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

- sign-in and sign-out 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; and
- 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 preschool.

### Opportunity

An opportunity exists to connect the Interview/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 Preschool entry area and Interview/Meeting Room is required to:

- be located at the main entrance to the Preschool and be readily accessible from the Preschool car park;
- entrance area to accommodate up to six people (standing, seated and with prams or using mobility aids);
- Interview/Meeting Room to accommodate four to five people;
- storage for toys and resources; and
- be located near the staff work area but not necessarily directly accessed from it.

#### 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

##### 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]

<b>FUNCTIONAL UNIT:</b>	<b>Preschool Playrooms</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of places	88	132
	Number of spaces and area      m <sup>2</sup>	2 x 90	3 x 90

### Design Intent

The Preschool 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, building cubby houses, and other make-believe activities which are often spontaneous;
- 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; and
- learning to self-manage belongings.

### Operational factors to consider

The playrooms are used in multiple ways and need to 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.

### Functional requirements

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

- be inviting and intriguing;
- give opportunities for children to choose varied spaces and develop gross motor skills through steps etc.;
- 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, and
- provide connectedness with an adjacent playroom.

#### Specific functional requirements

##### Spatial 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)  
line of sight visibility to the quiet activities area  
discrete visual connectedness to the children's toilets

##### 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

#### Fitout:

developmentally appropriate comfortable chairs in the entrance area and meeting room  
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  
whiteboard or writeable surface(s)  
clock  
window furnishings

#### ICT: [Refer Technical Specification]

AV display with requisite data and power  
Phone

<b>FUNCTIONAL UNIT:</b>	<b>Quiet Activities Areas</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of child places	88	132
	Total to serve the playrooms	30m <sup>2</sup>	45m <sup>2</sup>

### 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; and
- 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; and
- provide storage for bedding, soft toys and other resources.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> open adaptable space</p> <p><b>Visibility:</b> sufficient to see that the meeting room is vacant or occupied reduced natural light with the capacity to darken</p> <p><b>Acoustics: [Refer Technical Specification]</b> acoustic separation for adjacent spaces</p>	<p><b>Fitout:</b> 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</p> <p><b>ICT: [Refer Technical Specification]</b> wireless coverage</p> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Kitchen</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of places	88	132
	Total to serve the playrooms	15m <sup>2</sup>	15m <sup>2</sup>

### 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.

If the Kitchen is not readily accessible from at least one Playroom, a kitchenette is required to be included in one Playroom to provide for children with special 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; and
- include an island bench or equivalent for users to gather around over tea/coffee.

#### 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

##### Acoustics: [Refer Technical Specification]

acoustic separation from adjoining spaces

#### Fitout:

cooking facilities – hot plates, oven with rangehood  
microwave oven x 2  
dishwasher x2  
whiteboard or writeable surface  
medium sized domestic kitchen  
double sink for washing dishes  
sink for hand washing  
storage for cooking equipment, crockery and utensils

#### ICT: [Refer Technical Specification]

wireless coverage  
requisite power and data

#### Security: [Refer Technical Specification]

<b>FUNCTIONAL UNIT:</b>	<b>Store Room</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of places	<b>88</b>	<b>132</b>
	Total to serve the playrooms	18m <sup>2</sup>	27m <sup>2</sup>

### 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

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

- provide adjustable shelving;
- floor area for large toys; and
- 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

<b>FUNCTIONAL UNIT:</b>	<b>External learning environments/play areas</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of child places	88	132
	Area m <sup>2</sup>	1000	1000

### Design Intent

While the internal environment of a Preschool Community 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; and
- 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. Preschool 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

A significant opportunity to enhance transition between Preschool and Kindergarten is made possible by the integration of the Preschool with the Primary school as one school. Linkages between the Preschool Learning Community and the K-2 Learning Community can occur between the external and internal learning environments. Locating part of the external learning and play area for the K-2 Learning Community adjacent to the Preschool external learning and play area can facilitate the process of teachers providing opportunities for children to mix across the communities.

### Functional requirements

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

- provide a minimum of 7 m<sup>2</sup>/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; and
- provide developmentally appropriate play equipment.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> sufficient space around equipment and structures for running zoned for various activity types e.g. wet vs. dry</p> <p><b>Visibility:</b> 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</p> <p><b>Security: [Refer Technical Specification]</b> secure perimeter</p>	<p><b>Fitout:</b> developmentally appropriate play equipment and landscape elements sand pit water play 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.</p>
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childproof gates	ICT: N/A
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<b>FUNCTIONAL UNIT:</b>	<b>Equipment Store(s)</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of places	<b>88</b>	<b>132</b>
	Total to serve the playrooms m <sup>2</sup>	40	45

### 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; and
- large sink to wash toys.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> all shelving accessible and objects stored visible level entry for trikes, carts etc.</p> <p><b>Visibility:</b> Natural light not needed Bright light for effective viewing of stored objects</p> <p><b>Acoustics: N/A</b></p>	<p><b>Fitout:</b> adjustable shelving large sink with cold water floor waste</p> <p><b>ICT: N/A</b></p> <p><b>Security: [Refer Technical Specification]</b> child proof security lockable door</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Teacher Work Space Preschool Learning Community</b>		
<b>FUNCTIONAL AREA:</b>	<b>Preschool Learning Community</b>		
<b>Indicative area:</b>	Number of child places	<b>88</b>	<b>132</b>
	m <sup>2</sup>	24	36

### Design Intent

Teacher workspaces provide a space where teachers can work individually and collaboratively to meet, engage in dialogue and discussion, design and plan, analyse student data together, access resources, write records, store resources and secure personal belongings. Although they might serve as a social and recreation space, they are not primarily intended for that purpose.

Ideally there is one Teacher Work Space per Learning Community (not one per Learning Neighbourhood) as the notion of a Learning Community is that the students and teachers in the Learning Community are grouped together as a community with related learning needs.

### Operational factors to consider

Depending how the school chooses to organise and operate its Learning Communities, the Preschool teachers could be collaborating with an early childhood team that includes the Primary school teachers from the Primary section of the school.

While providing a retreat from the Preschool playrooms, the Staff Work Area needs to be readily accessed.

The Teacher Work Space might, at times, be used for meetings with parents.

### Functional requirements

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

- individual work stations for each staff member;
- storage for resources—files, books, folders, other teaching resources;
- secure storage for individual belongings;
- a setting to support collaborative work; and
- display area for resources and a ‘data wall’ (display of student data tracking performance and progress).

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> zones for individual and collaborative work sufficient space to provide ease of movement between work stations, storage and the collaboration zone</p> <p><b>Visibility:</b> line of sight to the Playrooms and entry area natural light</p> <p><b>Acoustics: [Refer Technical Specification]</b> acoustic separation from adjacent spaces</p>	<p><b>Fitout:</b> meeting table and chairs to accommodate up to eight staff and visiting professionals/staff in team design and planning individual teacher work stations/desks with secure storage section individual storage shelves and under desk filing cabinet storage for Learning Neighbourhood/Community teacher resources display board whiteboard</p> <p><b>ICT: [Refer Technical Specification]</b> Power and data to each work station Power and data for fixed or mobile AV display</p> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Children's Toilets</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of child places	88	132
	As per BCA requirements (see 5.5.4)		

### Design Intent

To provide supervised toilet facilities for preschool 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.
- Storage for towels and spare clothing.
- Adult hand washing facilities with hot water.
- Adequate heating will be required in this area.

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 over time.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout: BCA requirements</b></p> <p><b>Visibility:</b> discrete visual connectedness to the children's playrooms and external learning environment</p> <p><b>Acoustics: [Refer Technical Specification]</b> capability to limit sound into and out of the playroom</p> <p><b>Security: N/A</b></p>	<p><b>Fitout: [Refer Technical Specification]</b> developmentally appropriate toilet pans and wash basins premixed tempered water towel hooks – one per child overhead storage cupboard for towels and spare clothing first aid cabinet natural and mechanical ventilation</p> <p><b>ICT: N/A</b></p>
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<b>AMENITY:</b>	<b>Staff Toilets (Male and Female) Preschool</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	See 5.5.4 for toilet requirements		

### Design Intent

To provide amenities for staff close to their teaching space.

### Operational factors to consider

The ratio of male to female staff in ACT schools in general is approximately 1:5 with Preschools having a much higher number of females to males.

### Functional requirements

The Staff Toilets are required to:

- be provided in compliance with BCA requirements in this is adequate for the functional use of the school; and
- be located on an external wall with natural ventilation if possible.

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

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> 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</p> <p><b>Visibility:</b> 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 centre/ lounge.</p> <p><b>Acoustics: [Refer Technical Specification]</b> able to be acoustically contained</p>	<p><b>Fitout: [Refer Technical Specification]</b> 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 floor waste ventilation to the external air mechanical ventilation shower change area bench clothes hanging towel rack</p> <p><b>ICT: N/A</b></p> <p><b>Security:</b> internally lockable doors</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Accessible Toilet Preschool</b>		
<b>FUNCTIONAL AREA:</b>	Preschool Learning Community		
<b>Indicative area:</b>	Number of child places	88	132
	As per BCA requirements (see 5.5.4)		

### 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.

Disabled and visitor toilets are to be unisex.

### Functional requirements

As per BCA requirements.

## 7.4 Primary School General Learning Communities

<b>SCHOOL SECTION:</b>	<b>Primary School</b>		
<b>FUNCTIONAL AREA</b>	<b>PRIMARY LEARNING COMMUNITIES</b>		
<b>LOCATION:</b>	Arranged around a central gathering space/plaza		
<b>Indicative Area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup> [plus additional area provision to contain engineering and circulation functions based on the Contractor's design]	1935	2580
	Amenities as per BCA requirements (see 5.5.4)		

**Overview**

The 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, 21<sup>st</sup> Century learning is most obvious. As outlined in Section 3.8, contemporary learning environments are designed to support and enable:

- collaboration between students;
- collaboration between professionals for designing, planning *and* teaching;
- personalised learning, which requires flexible, responsive grouping of students—1 to 1, 1 teacher working with small groups, students working without direct teacher involvement, individual work;
- student self-regulation, self-direction and self-management;
- holistic, authentic learning— purposeful, personally significant, experiential, real projects;
- assessment in context;
- connectedness—with community, virtually locally and globally, within and across subjects;
- seamless access to rich resources—digital, information, equipment and materials; and
- learning anytime, anywhere and with anyone.

The general term 'Learning Community' refers to an *organisational grouping* of students 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.

The Learning Neighbourhood acts as the *physical learning home* for a group of students 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 students who share the 'learning home' and where their work, ideas and achievements are presented and celebrated.

Learning Neighbourhoods can range in size. There is no definitive 'ideal size' but there are general principles that operate and the design of the Learning Neighbourhood facilities needs to be able to be adaptable to meet these principles.

The Directorate's commitment to professional collaboration and professional mentoring dictates that the *minimum size of a Learning Neighbourhood is two teachers with a neighbourhood group of students* that could generally range in size from 42 to 50 students. Learning Neighbourhoods that include students with disability can have smaller numbers of students. Learning Neighbourhoods with three teachers and 63–75 students are quite common as the team of three teachers gives greater flexibility for student groupings and for co-teaching options. The maximum size of a Learning Neighbourhood in a Primary School is generally ≤100 students.

In contemporary learning environments, many resources and learning spaces are shared *within* a Learning Neighbourhood and some learning spaces might be shared *between* Learning Neighbourhoods.

**Functional Units for General Learning Communities**

- Staff work areas.
- Learning Neighbourhoods.
- Facilities to support the learning of students with disability.
- Meeting spaces—within, and/or shared between Learning Neighbourhoods.
- Integrated external learning settings.
- Communal spaces for performances, presentations and gatherings— within, and/or shared between Learning Neighbourhoods.
- Storage.

## Operational factors to consider

In the past schools were designated as ‘one-stream’, ‘two-stream’ schools which were based on the number of student class groups in a year group. The reality of enrolment and demographic patterns means that the numbers of students in each year level will vary considerably and, as schools move to personalise learning, the focus moves away from what ‘year’ a child is in to what their learning needs are. Traditional year groupings dissolve into stages of learning. The basic unit of design for the K-6 component of a P-6 school is based on Learning Communities of 150.

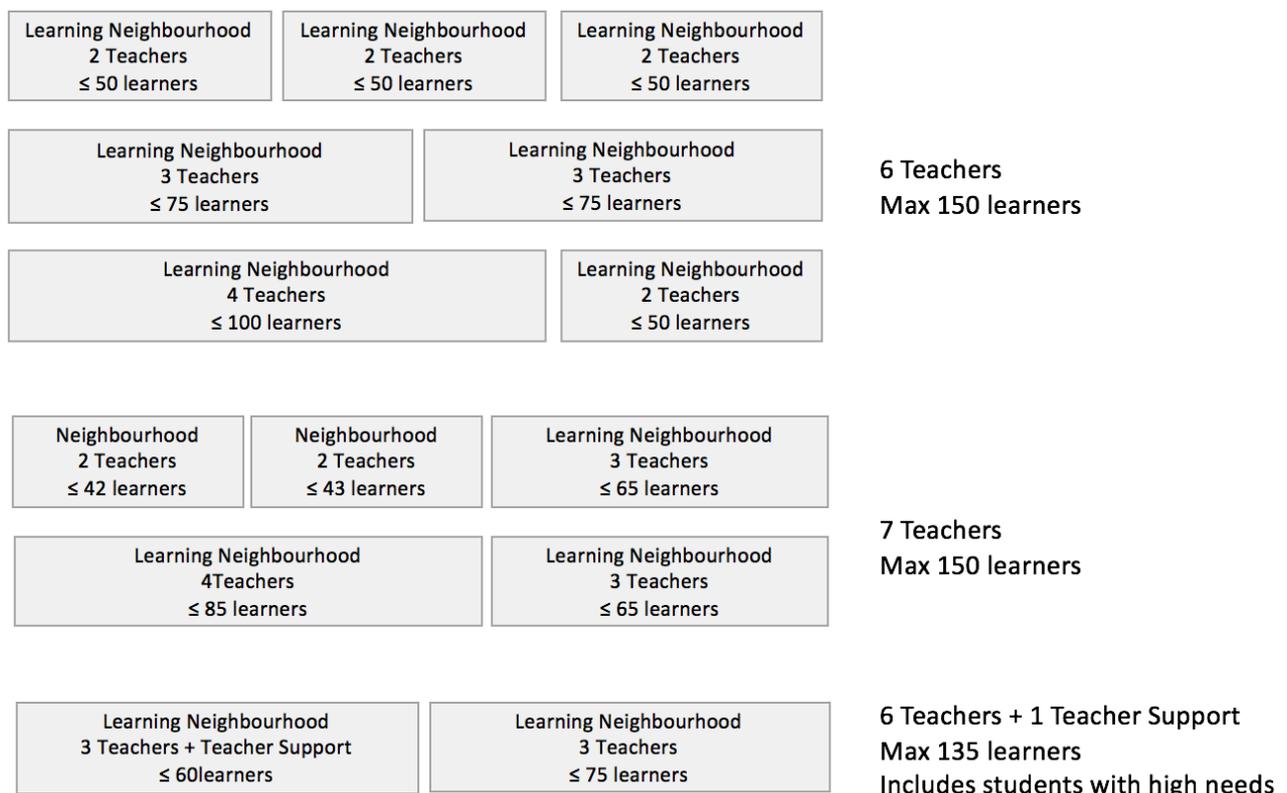
The design of the Learning Neighbourhoods and the Learning Community buildings supports this approach to school organisation.

A larger building that can accommodate several Learning Neighbourhoods is preferable as this configuration not only provides efficiency in use of space dedicated to plant and engineering, but also enables flexibility in the configuration and distribution of larger and smaller Learning Neighbourhoods.

Moving away from the ‘single-cell’ model allows much greater flexibility in the ways in which Learning Neighbourhoods can be configured in response to students’ needs and to accommodate fluctuating numbers of students.

Designs based on Learning Neighbourhoods change the way that the allocation of area is conceptualised. In Learning Neighbourhood based designs, area allocation is based on the numbers of students NOT the number of teachers. A reasonable guideline for creating Learning Neighbourhoods and Learning Communities within the primary section of a school is to create Learning Communities for a maximum of 150 students with six or seven teachers as this supports Learning Neighbourhoods as follows:

**Figure 7 Possible configurations of Learning Neighbourhoods within a Learning Community area that can accommodate up to 150 students.**

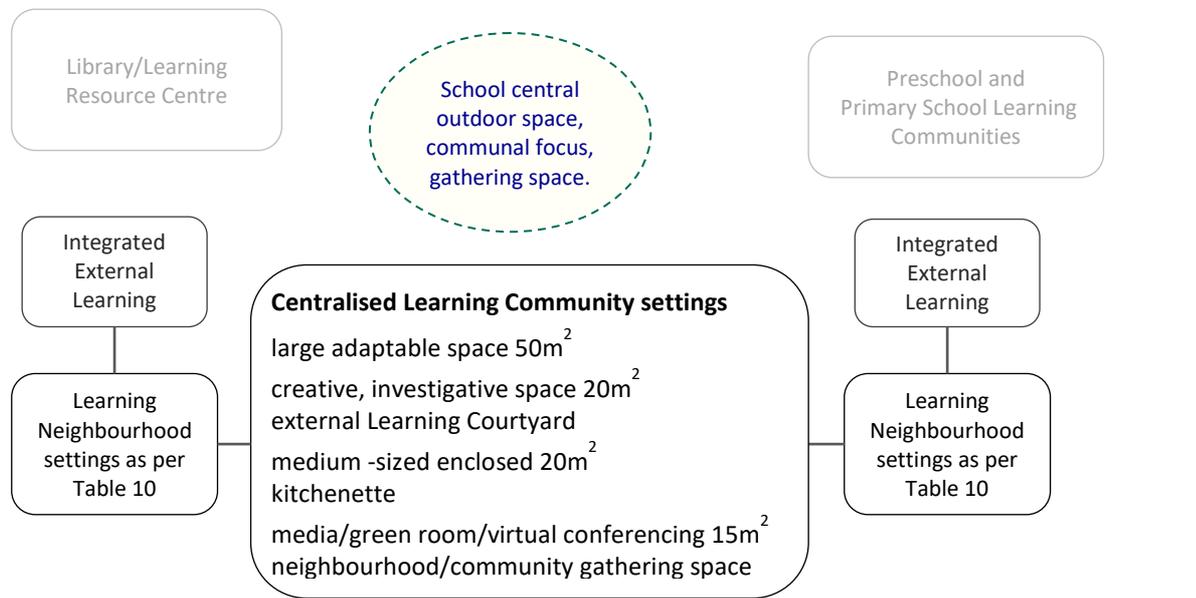


The second important operational factor to consider in the design of Learning Community buildings is the inclusion of facilities to support students with disability. In each of the P–Year 2 and Year 3–Year 6 sections of a primary school, facilities to support students with high needs are integrated into the Learning Community design. Having facilities for learning support integrated into the Learning Community Buildings enables schools to respond flexibly to the numbers of students needing inclusion support and to determine the extent of inclusion of students based on their individual needs and capabilities.

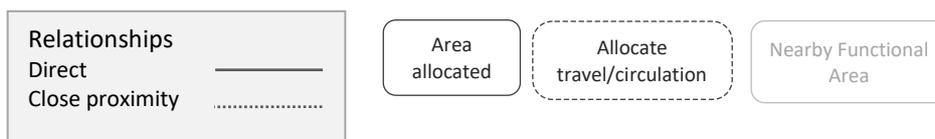
In some instances, it might be most appropriate to dedicate this specially designed area of the Learning Neighbourhood/Learning Community to a small group of students and two staff and for it to work as a self-contained unit. In other situations, there may be a larger degree of integration of students with the surrounding neighbourhoods.

More information about the size, configuration and operation of Learning Neighbourhoods is provided under the details for that Functional Unit.

## Functional Relationships for Primary School Learning Communities



### Key:



Specific functional requirements for learning settings designed to support varied learning and teaching activities

### Learning Settings

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 students and exposure to a range of stimuli.

### Specific functional requirements for the design of learning settings

The specific functional requirements for Learning Settings for Learning Neighbourhoods are summarised in Table 10.

Table 10 describes the specific requirements for each learning and teaching mode in terms of spatial layout, acoustics, visibility, fit out and ICT. This table should be referenced as a guide to designing learning settings both within the general and specialist facilities.

Example illustrations of these settings are shown in Figures 8–9.

### Learning Settings: Two Learning Neighbourhoods within a Learning Community

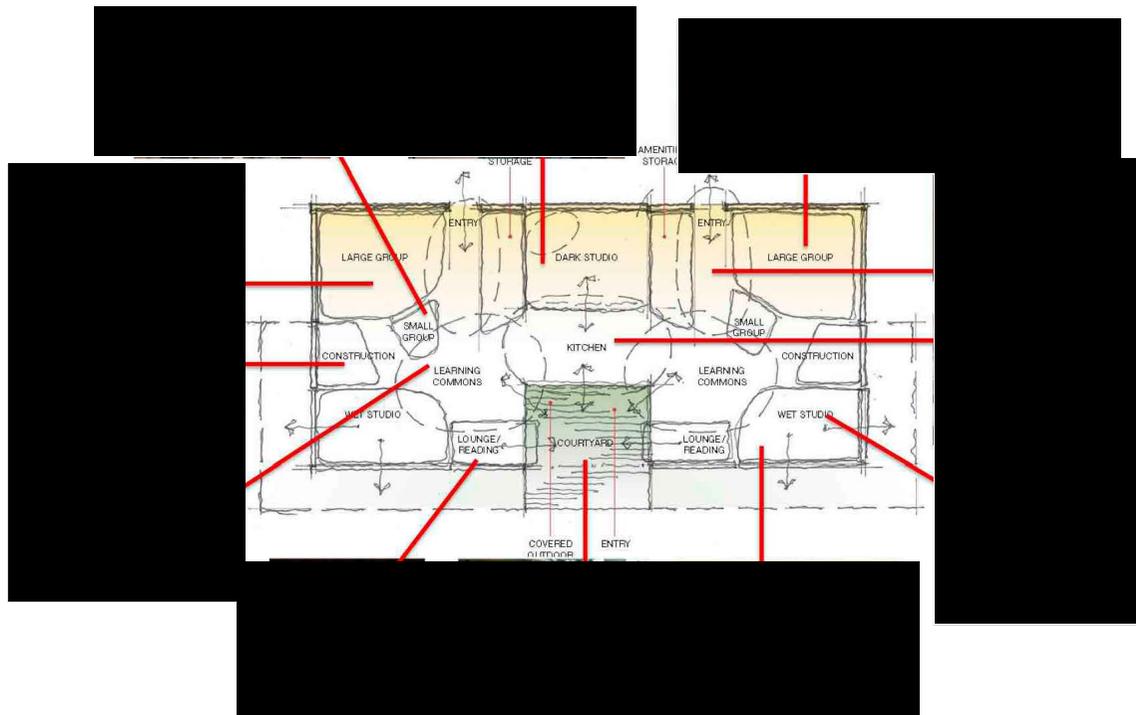
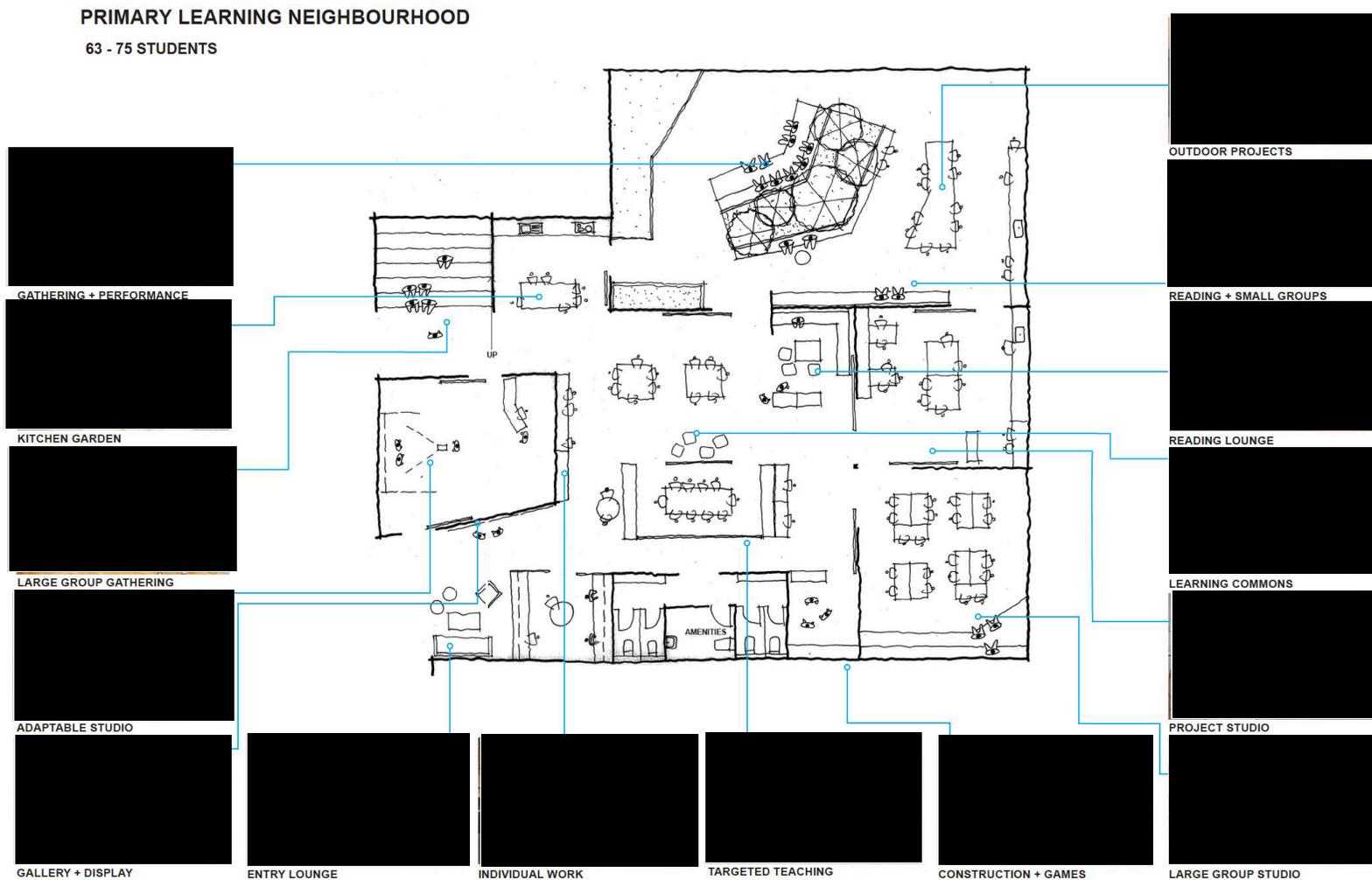


Figure 8 Two Learning Neighbourhoods within a Learning Community

Figure 9 A Learning Neighbourhood for 63-75 students within a Learning Community



The following table, Table 10, shows the spatial layout, acoustic, visibility and fit out requirements for learning settings that support each mode of learn Specific functional requirements for learning settings designed to support varied learning and teaching activities. Reference to this table will ensure that the design and fit out of each the learning settings is fit for purpose.

**TABLE 10 FUNCTIONAL REQUIREMENTS FOR INTERNAL AND EXTERNAL LEARNING SETTINGS DESIGNED TO SUPPORT VARIED LEARNING AND TEACHING ACTIVITIES**

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Learning activity	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• demonstrate</li> <li>• model</li> <li>• communicate ideas</li> <li>• teach explicitly</li> </ul>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• explore ideas</li> <li>• share and develop opinions</li> <li>• listen to stories and oral presentations</li> <li>• discuss issues</li> </ul>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• plan</li> <li>• discuss</li> <li>• make decisions</li> <li>• collaborate in a quiet, focussed environment</li> <li>• meet virtually</li> </ul> <p>Teachers:</p> <ul style="list-style-type: none"> <li>• counsel students in privacy</li> <li>• tutor students</li> </ul>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• engage in structured collaborative activities</li> <li>• collaborate spontaneously at point of need</li> <li>• engage in games</li> </ul>	<p>Students and teachers engage in:</p> <ul style="list-style-type: none"> <li>• hands on interaction</li> <li>• reflection</li> <li>• generating ideas</li> <li>• exploration to design, create, express, evaluate and display.</li> </ul> <p>Depending on the creative medium or combination of media (e.g. visual art, dance, music, digital) and the size of equipment, these activities can require a range of settings from very specialised to more generalised spaces.</p>	<p>Students and teachers engage in:</p> <ul style="list-style-type: none"> <li>• hands on interaction</li> <li>• experimentation</li> <li>• evaluation</li> </ul> <p>with a range of materials and equipment in indoor and outdoor settings to discover and test. Depending on the medium for investigation, these activities can require a range of settings form very specialised to more generalised spaces.</p>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• implement</li> <li>• build</li> <li>• assemble</li> </ul> <p>in indoor and outdoor learning environments using materials, systems and media. Depending on the nature of the equipment, construction, modelling and simulation activities can require a range of settings from very specialised to more generalised.</p>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• display</li> <li>• exchange</li> <li>• engage with learning artefacts to access information and to communicate and celebrate learning.</li> </ul>	<p>Students and teachers engage with written and graphical material in digital or hard copy form to:</p> <ul style="list-style-type: none"> <li>• personally reflect</li> <li>• enquire</li> <li>• research</li> <li>• consolidate learning</li> </ul>	<p>Students and teachers:</p> <ul style="list-style-type: none"> <li>• practise</li> <li>• refine and</li> <li>• execute</li> </ul> <p>performance based activity in 'makeshift' and purposefully designed settings.</p> <p>The Learning Neighbourhood/Learning Community gathers for community building activities.</p>

## Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Group size	To support these learning activities for individuals small (2–5), medium (6–12) and large (13–25) size groups, the setting must meet the following criteria:	To support these learning activities for small (2–5), to medium (6–12) size groups, the setting must meet the following criteria:	To support these learning activities with for small (2–5), to medium (6–12) size groups the setting must meet the following criteria:	To support these learning activities with small (2–5), medium (6–12), large (13–25) size groups (within a total number of people up to 50) the setting must meet the following criteria:	To support these learning activities for individuals and for small (2–5), to medium (6–12) size groups, possibly within a space occupied by others, the setting must meet the following criteria:	To support these learning activities for individuals and for small (2–5), to medium (6–12) size groups, possibly within a space occupied by others, the setting must meet the following criteria:	To support these learning activities for individuals and for small (2–5), to medium (6–12) size groups, possibly within a space occupied by others, the setting must meet the following criteria:	To support these learning activities for individuals and small (2–5), medium (6–12), large (13–25) size groups the setting must meet the following criteria:	To support these learning activities for individuals and very small groups (2–3) the setting must meet the following criteria:	To support these learning activities for individuals and small (2–5), medium (6–12), large (13–25) and very large (30–50+) size groups) the setting must meet the following criteria:

## Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Spatial Layout	<ul style="list-style-type: none"> <li>• can be adapted to suit the size of the group(s) involved</li> <li>• when several different groups are being taught simultaneously by different teachers in the same space, sufficient separation between groups must be possible to enable unhindered circulation and avoid acoustic and/or physical interference</li> </ul>	<ul style="list-style-type: none"> <li>• participants able to be seated 'in the round' facing each other</li> <li>• stepped or tiered seating if the participants need to sit more than one deep</li> </ul>	<ul style="list-style-type: none"> <li>• participants able to be seated around a table</li> <li>• participants able to face each other</li> </ul>	<ul style="list-style-type: none"> <li>• ratio of furniture to floor area enables a range of configurations of furniture and space</li> <li>• sufficient separation between groups to enable unhindered circulation and avoid acoustic and/or physical interference when several groups are collaborating on different projects simultaneously in the same general space</li> <li>• adaptable furniture configurations to support a range of different group sizes and collaborative activities</li> </ul>	<ul style="list-style-type: none"> <li>• sufficient space between groups for ease of movement and safe manipulation of materials and equipment</li> <li>• uncluttered workspace</li> <li>• adaptable table/bench/work areas to support a range of different activities</li> <li>• semi-enclosed to create focus, purpose and order</li> <li>• complete enclosure and secure access when required for safety reasons or noise isolation</li> </ul>	<ul style="list-style-type: none"> <li>• sufficient space between groups for ease of movement and safe manipulation of materials and equipment</li> <li>• semi-enclosed to create focus, purpose and order</li> <li>• complete enclosure and secure access when required for safety reasons or noise isolation</li> <li>• adaptable table/bench/work configurations to support a range of different activities</li> </ul>	<ul style="list-style-type: none"> <li>• sufficient space between groups for ease of movement and safe manipulation of materials and equipment</li> <li>• semi-enclosed to create focus, purpose and order</li> <li>• complete enclosure and secure access when required for safety reasons or noise isolation</li> <li>• adaptable table/bench/work configurations to support a range of different activities</li> </ul>	<ul style="list-style-type: none"> <li>• distributed and focal display areas</li> <li>• ready physical and visual access by all members of the audience eg, height of display appropriate for the age group; wheelchair access</li> <li>• sufficient space between display items to bring attention to individual items and avoid visual clutter</li> <li>• clear patterns of flow and access to artefacts within the space</li> <li>• safe access to introduce objects of varying size</li> </ul>	<ul style="list-style-type: none"> <li>• configured to provide one or more focussed area(s) for one or two individuals or small groups</li> <li>• out of major circulation pathways</li> <li>• adjacent to relatively passive learning settings and spaces</li> <li>• sufficient distance from other settings to afford privacy</li> </ul>	<ul style="list-style-type: none"> <li>• presentation/ performance space appropriate for size of performing group and the nature of the performance</li> <li>• comfortable personal space for members of the audience</li> </ul>

## Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Acoustics	<ul style="list-style-type: none"> <li>student, teacher or presenter voices clearly audible throughout the setting</li> <li>effective control of noise intrusion to and from adjoining areas.</li> </ul>	<ul style="list-style-type: none"> <li>participant voices clearly audible throughout the space</li> <li>effective suppression of noise intrusion to and from adjoining areas</li> </ul>	<ul style="list-style-type: none"> <li>effective suppression of noise intrusion to and from adjoining areas</li> </ul>	<ul style="list-style-type: none"> <li>effective suppression of noise generated by multiple collaborative groups working within the one area</li> <li>effective suppression of noise intrusion to and from adjoining areas</li> </ul>	<ul style="list-style-type: none"> <li>effective control of noise intrusion to and from adjoining areas</li> <li>suppression of noise associated with equipment</li> <li>effective suppression of noise generated by multiple collaborative groups working within the one area</li> </ul>	<ul style="list-style-type: none"> <li>effective suppression of sound between groups</li> <li>effective control of noise intrusion to and from adjoining areas</li> </ul>	<ul style="list-style-type: none"> <li>effective suppression of sound between groups</li> <li>effective suppression of impact noise</li> <li>control of noise intrusion to and from adjoining areas</li> </ul>	<ul style="list-style-type: none"> <li>effective suppression of sound that could distract from focus on the display/exchange</li> </ul>	<ul style="list-style-type: none"> <li>a quiet space</li> </ul>	<ul style="list-style-type: none"> <li>performer(s) voices and audio sources clearly audible throughout the space</li> <li>effective suppression of performance sounds and audience noise to adjoining learning settings</li> <li>effective control of noise intrusion from adjoining areas</li> </ul>

## Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Visibility	<ul style="list-style-type: none"> <li>controllable lighting</li> <li>student view of teaching focus/presenter unobstructed</li> <li>displayed material legible at all positions in the setting</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>controllable lighting</li> <li>face-to-face view of all participants</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>controllable lighting</li> <li>face-to-face view of all participants</li> <li>unobstructed view of display area(s)</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>abundant natural light</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>lighting appropriate to the nature of the activity, e.g. controllable for media work, direct lighting to workspace that requires good hand-eye co-ordination</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>lighting appropriate to the nature of the activity, e.g. controllable for horticultural experiments</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>line of sight vision of activities in the setting from at least one adjacent area for passive supervision</li> <li>line of sight vision of activity in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>controllable lighting</li> <li>abundant light on the displayed items</li> <li>capacity to highlight</li> </ul>	<ul style="list-style-type: none"> <li>line of sight vision of activities in the setting from at least one adjacent area for passive supervision</li> </ul>	<ul style="list-style-type: none"> <li>controllable general and selective lighting</li> <li>audience view of performance unobstructed</li> <li>line of sight vision of activities in the setting from at least one adjacent area for passive supervision</li> </ul>

## Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Fit out	<ul style="list-style-type: none"> <li>a teaching or presentation focus—e.g. a horizontal display central to the group and/or vertical AV display, whiteboard, ‘teaching wall’</li> <li>comfortable seating</li> <li>support for students’ materials—mobile devices, writing, reading matter</li> <li>storage capacity close at hand to suit the equipment and resources required for each setting</li> </ul>	<ul style="list-style-type: none"> <li>comfortable seating</li> <li>an intimate, semi-enclosed feel with minimal visual distractions</li> <li>support for any materials to be displayed</li> </ul>	<ul style="list-style-type: none"> <li>a table or tables that can be adapted to suit the group size and to provide access for all users</li> <li>chairs</li> <li>writeable surface(s) for group planning</li> <li>storage capacity close at hand to suit the equipment and resources required for each setting</li> </ul>	<ul style="list-style-type: none"> <li>tables, benches and combinations of tables/ benches, able to accommodate groups of two–eight</li> <li>a variety of types of seats/chairs that are readily moved by the users</li> <li>rearrangement of furniture to suit required group size able to occur in less than five minutes</li> <li>fixed storage to organise and secure equipment and resources commonly used in the area</li> <li>mobile storage for small equipment and resources for transport to collaborative groups</li> <li>stowing place(s) for mobile storage so that it can be housed without intrusion into the collaborative space when not in use</li> </ul>	<ul style="list-style-type: none"> <li>needs vary according to the activities thus requiring that bench size and height and associated seating must be appropriate for any specific equipment and to provide access for all users</li> <li>special purpose settings and specialised resources and equipment for specific creative activities intended for the setting – e.g. 2D or 3 D art, digital media creations</li> </ul>	<ul style="list-style-type: none"> <li>needs vary according to the activities thus requiring that bench size and height and associated seating must be appropriate for any specific equipment and to provide access for all users</li> <li>special purpose settings and specialised resources and equipment for specific investigative activities intended for the setting—e.g. controllable lighting, stainless steel benchtops for horticultural activities; surfaces resistant to chemical interaction for chemistry activities</li> <li>bench and floor surfaces with degree of durability suited to the type of activities intended for the space</li> </ul>	<ul style="list-style-type: none"> <li>can require special purpose settings and specialised resources and equipment</li> <li>work spaces/benches appropriate for group size and materials</li> <li>highly durable surfaces and surfaces that support short-term display</li> <li>storage for materials, equipment and work in progress</li> </ul>	<ul style="list-style-type: none"> <li>a combination of fixed and adaptable partitions, display boards, display cases and systems for hanging items</li> <li>an inviting aesthetic quality</li> <li>neutral finishes</li> </ul>	<ul style="list-style-type: none"> <li>inviting and comfortable furniture</li> <li>sufficient space and surfaces to work effectively with resources</li> </ul>	<ul style="list-style-type: none"> <li>can require special purpose fit-out, specialised resources/equipment</li> <li>adequate storage for equipment</li> <li>neutral and durable finishes</li> <li>surfaces that support display</li> </ul>

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Fit out					<ul style="list-style-type: none"> <li>• direct access to an appropriate number of wet areas to suit the demand related to the activity and the number of users of the space</li> <li>• bench and floor surfaces with degree of durability suited to the type of activities intended for the space</li> <li>• safety measures appropriate for the materials and the nature of the users must be included</li> <li>• bench and storage spaces for a range of sizes of works in progress</li> </ul>	<ul style="list-style-type: none"> <li>• direct access to wet areas</li> <li>• safety measures appropriate for the materials and the nature of the users must be included</li> <li>• storage for ordered placement and ready access to materials and equipment</li> <li>• storage and/or space for investigative projects requiring extended time</li> <li>• display areas for learning resources</li> </ul>	<ul style="list-style-type: none"> <li>• secure storage for equipment that is expensive or potentially dangerous if used without close supervision</li> <li>• mobile storage for sets of specialised materials and or equipment</li> <li>• stowing place(s) for mobile storage so that it can be housed without intrusion into the collaborative space when not in use</li> </ul>			

Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Fit out					<ul style="list-style-type: none"> <li>display areas for learning resources</li> <li>storage for ordered placement and ready access to materials, equipment and tools</li> <li>storage capacity close at hand to suit the equipment and resources required for each setting</li> <li>secure storage for equipment that is expensive or potentially dangerous if used without close supervision</li> <li>mobile storage for sets of specialised materials and or equipment</li> </ul>	<ul style="list-style-type: none"> <li>secure storage for equipment that is expensive or potentially dangerous if used without close supervision</li> <li>mobile storage for sets of specialised materials and or equipment</li> <li>direct access to an appropriate number of wet areas to suit the number of users of the space</li> </ul>				

Commercial in confidence

	Direct explicit teaching, demonstration, presentation	Dialogue, storytelling, community of inquiry	Conduct meetings, virtual conferencing, small seminars	Structured and free-form collaboration and indoor games	Engage in creative activities with media, general and specialised equipment and materials (wet and dry) and/or imaginative play	Engage in investigative activities with general and specialised equipment and materials (wet and dry)	Construction, modelling and simulation through play based learning and/or authentic settings	Display of learning resources and student work	Quiet reflective activities and/or individual research.	Rehearsal and performance in the arts, languages and physical activity; neighbourhood and community celebration, exhibitions and gatherings
Fit out					stowing place(s) for mobile storage so that it can be housed without intrusion into the collaborative space when not in use					

## Commercial in confidence

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ICT	<ul style="list-style-type: none"> <li>• data, power and media presentation facilities accessible at the point of presentation</li> <li>• ready access to required resources including ICT</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> <li>• dimensions and height of AV display screen appropriate to the viewing depth and width</li> </ul>	<ul style="list-style-type: none"> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> </ul>	<ul style="list-style-type: none"> <li>• data, power and AV display for spaces intended to support virtual conferencing</li> </ul>	<ul style="list-style-type: none"> <li>• seamless and safe access to resources, services and ICT throughout</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> <li>• data and power outlets for high-end media, number to suit size of setting- minimum coverage is one per 60m<sup>2</sup> for mobile of fixed AV display</li> </ul>	<ul style="list-style-type: none"> <li>• seamless and safe access to resources, services and ICT throughout</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> <li>• data and power outlets for high-end media, number to suit size of setting- minimum coverage is one per 60m<sup>2</sup> for mobile of fixed AV display</li> </ul>	<ul style="list-style-type: none"> <li>• seamless and safe access to resources, services and ICT throughout</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> </ul>	<ul style="list-style-type: none"> <li>• seamless and safe access to required resources, services and ICT for all participants</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> </ul>	<ul style="list-style-type: none"> <li>• access to utilities and services, including data and power for AV screens at points of display</li> <li>• wireless coverage to the extent of no less than 25 users in any space, both internal and external</li> </ul>	<ul style="list-style-type: none"> <li>• ready access to required resources and ICT including wireless throughout internally and externally</li> </ul>	<ul style="list-style-type: none"> <li>• data, power and media presentation facilities accessible at the point of presentation</li> <li>• ready access to required resources including ICT and wireless access throughout</li> <li>• dimensions, and height of display relative to line of sight vision, appropriate to the viewing depth and width ready access to resources and ICT</li> </ul>

<b>FUNCTIONAL UNIT:</b>	<b>Primary School Learning Neighbourhood</b>		
<b>FUNCTIONAL AREA:</b>	Primary School General Learning Community		
<b>Indicative area:</b>	<b>Enrolment</b>	<b>450</b>	<b>600</b>
	m <sup>2</sup> /Learning Community 150 students	3 x	4 x
	m <sup>2</sup> /Learning Neighbourhood is dependent on design solution for Learning Community shared spaces	600	600

### Design Intent

Learning Neighbourhoods provide a sense of belonging and contribute to building a community of students and provide students with a sense of belonging to that community. They serve as the 'learning home' for a group of students 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 a group of other students.

Learning Neighbourhoods include integrated, general and specific purpose learning settings (Table 10) within larger Learning Communities. The combination of learning spaces in the Learning Neighbourhoods work in conjunction with additional specialist facilities to enable implementation of all aspects of the Australian Curriculum.

Learning Neighbourhoods are designed to:

- create a sense of belonging and community building;
- provide contemporary learning environments (Section 3.8);
- facilitate professional collaboration for designing, planning *and* teaching;
- enable formation of different sized learning groups; and
- facilitate sharing of neighbourhood resources and learning spaces.

### Integration of facilities for students with disability.

The integration of facilities for students with disability into Learning Communities is a key step in providing inclusive education. To achieve the design intent, which is to remove 'whatever excludes or marginalises' and remove 'barriers to inclusion' thoughtful design is required. Providing support for students with high needs is more than just providing facilities and spaces, however specific features of the designed learning environment can provide important support for the particular needs of students with disability, and can be beneficial for all students. It is known that many of the small scale environmental modifications that enable students with disabilities to participate in inclusive educational environments also improve the environment for students who were not classified as having special needs. Similarly, the areas of the Learning Community not deliberately designed to support students with high needs, should be readily accessible to students with disability.

One of the challenges in designing for students with disability is the range of the types of disability.

Autistic spectrum disorders.

Emotional and behavioural disorders.

Cognitive impairment.

Physical disability – impaired mobility, hearing and/or sight.

Children with disability can display two or more of these categories.

The design challenge requires a generic basic design that can be customised and adapted with furniture and equipment to address the particular needs of the children accessing the learning support at any given time whether they be children with disability, a mix of students or students without disability.

The needs of children with autistic spectrum disorders vary from child to child. But all students can benefit from environments that are designed with awareness of potential challenges and disturbance triggers that must be avoided and an awareness of the characteristics of environments that provide support for autism spectrum disorders.

Key elements for inclusive, supportive physical learning environments include:

- structured environments;
- safe and secure internal and external educational spaces;
- controlled access to multi-sensory equipment, technology and highly reinforcing activities;
- adaptable spaces and spatial variety;
- non-threatening larger spaces – including elements with a sense of enclosure, intimacy;
- spaces for refuge;

- absence of clutter;
- natural light;
- avoidance of flickering or strobing light sources;
- temperature 26°;
- predictable navigation;
- safety for those who might injure themselves or others; and
- a residential rather than an institutional feel.

Buildings that are predictable, consistent and orderly have calming effect on students with sensory and behavioral issues and help them to focus on learning activities. Learning spaces that are arranged to allow several activities to happen simultaneously and support groups of various sizes, increase the teachers' flexibility and promote interdependence among students. A useful fact sheet<sup>29</sup> to guide design features, to ensure the needs of students with disability are met, has been developed by the NZ Ministry of Education.

### Operational factors to consider

The specific manner in which individual schools organise and operate teaching and learning groups varies widely across schools and within schools depends to a very large extent on the needs of the students. It is important to develop an understanding of the examples of a 'day in the life of a Primary School Learning Neighbourhood' (Section 6.5) to develop a design that can support any of these operational examples. The indicative area allocated for the Learning Neighbourhoods/Learning Communities for F–6 assumes 90–95% occupancy. Careful consideration needs to be given to designing spaces that are capable of being adapted readily for different functions.

The Learning Communities need to have spaces that are capable of operating with restricted access to the adjoining Learning Neighbourhood or of operating in a very integrated manner with the degree of integration required possibly varying from day to day.

### Functional requirements

The Learning Neighbourhood is required to provide a contemporary learning environment with internal and external Learning Settings and environments to support the full range of learning activities (Table 10) for all students, including students with disability, working in a range of group sizes from individual, to one to one, to small collaborative groups, medium and larger group learning.

### Learning activities

- Direct, explicit teaching, demonstration and presentation for small (2-5), medium (6-12) and large groups (13-25).
- Dialogue, storytelling, community of inquiry, circle groups for groups (8–15).
- Meetings for discussion, planning and decision-making for small (2–5) and medium (6-12) groups.
- Structured and free-form interaction and collaboration in small (2–5) and medium (6-12) groups.
- Indoor games.
- Hands on, creative activities (wet and dry) with general equipment and materials.
- Creative activities with media e.g. sound recording, movie production.
- Investigative activities (wet and dry) with general equipment and materials.
- Construction, modelling and simulation through play-based learning and/or hands-on activities, display of learning resources and student work.
- Quiet reflective activities and/or individual research.
- Rehearsal and performance.
- Learning Neighbourhood and Learning Community gatherings, ceremonies and celebrations.

The Learning Neighbourhood design is also required to:

- enable the creation of 'home bases' and provide integrated/distributed storage for student personal effects and belongings; provide extensive space for display and celebration of the creative work and learning achievements of students;
- provide storage – fixed and mobile – for teaching and learning resources;
- be activated with loose furniture, equipment and fitout elements to support the functions listed

<sup>29</sup> NZ Ministry of Education, Teaching and Learning Environments to support students with special education needs or disabilities. <http://www.education.govt.nz/assets/Documents/Primary-Secondary/Property/School-property-design/Flexible-learning-spaces/MLESpecialEdFactsheet.pdf>

above;

- include ICT capability and equipment as specified for each setting; and
- be carefully zoned to avoid acoustic interference between different functional areas.

### Functional requirements for Learning Settings

Learning Settings :

- are purposefully designed for particular learning activities;
- can, in some cases, be used for more than one type of activity;
- can be both internal and external; and
- external learning environments, must be integrated with indoor learning areas and act as an extension of indoor settings.

The functional requirements – spatial layout, fit out, acoustics, visual and ICT – for different types of Learning Settings is summarised in Table 10, and must be referred to during the design process and design development.

### Summary guidelines for the design of Home-bases

#### 'Home-bases'

In the 'single-cell' model, a classroom defined a 'home-base'.

In a Learning Neighbourhood/Learning Community model, students still have a home-base but it is not defined by a classroom. Students still require:

- a place for their belongings;
- a location with which they identify; and
- a place to gather with their 'family' of students and the teacher(s) immediately responsible for their learning and wellbeing.

Rather than being a fixed 'classroom', 'home-bases' in Learning Neighbourhoods can be created by placing moveable banks of totes/trays and bag storage close by an area where up to 25 students can be seated on the floor, or on a mixture of tiered seating, bench stools and chairs. Quite commonly, the student personal effects storage is used for zoning and demarcation of different learning spaces.

The key principles for the design and fit out of 'home-bases' within Learning Neighbourhoods are:

- storage for students' belongings should be distributed throughout the Learning Neighbourhoods;
- in each Learning Community area, the number of gathering spaces for 20-25 students that need to be able to be configured is dependent on the need to provide for up to seven **home-bases**;
- one of the spaces that can serve as home base must be relatively central, close to an accessible bathroom, capable of being securely closed, have direct access to a secure courtyard sensory garden with external learning setting/play area; and
- a variety of learning settings can be used as a home-base if they are designed as a suitable gathering space to accommodate 25 students seated on the floor or on a mixture of tiered seating, table seating and floor.

### Guidelines for the number of each type of Learning Setting in Learning Neighbourhoods and Learning Communities

The key factors involved in determining the number of each type of setting (Table 10) per Learning Neighbourhood and per Learning Community are:

- the demand for simultaneous use;
- the specific needs of students with disability; and
- the number of types of learning activities that a setting supports—how adaptable it is.

For example, a small, acoustically contained space can be used for virtual conferencing, planning meetings, and explicit teaching of a small group, language or drama rehearsal. It does not accommodate many people at one time so given its multiple uses it will be in relatively high demand.

A medium sized acoustically contained room with large, deep storage cupboards can store a range of furniture, equipment and soft furnishings making it adaptable for use as a therapy or sensory enrichment space for students with disability, for use as a medium sized acoustically contained space for language or drama rehearsal or for a virtual conferencing space or meeting room.

An open collaborative space can be used in many ways. It can accommodate many small groups involved in different activities; a mixture of explicit teaching groups, small collaborative groups and individuals working; and it can be used as a large group gathering or presentation space.

In contrast, a 'green screen' media room, if provided, that is equipped with recording and broadcasting equipment has a specialised use and, although it can be used as a back up meeting room, or explicit teaching space, it is less adaptable. It will be in relatively low demand and is therefore more suited to being shared between Learning Neighbourhoods on a Learning Community basis.

The following guidelines are provided for the more defined Learning Settings.

For Learning Neighbourhoods of 60–75 students:

- 2 x small acoustically contained spaces for up to six occupants seated around a meeting table; and
- 1 x medium acoustically contained space for up to twelve occupants seated around a table or tables.

For a Learning Community of up to 150 students:

In addition to the above Learning Settings for 60–75 students, functional units and Learning Settings that can be centrally co-located in a Learning Community of 150 students and shared between Learning Neighbourhoods include:

- 2 x large acoustically contained space capable of accommodating up to 25 occupants seated, or using all floor space, up to 25 students involved in movement (e.g. dance, yoga);
- 1 x large presentation/performance space that can accommodate up to 75 students seated in seats, tiered seating and/or on the floor;
- 1 x 'green screen' media studio space; and
- an acoustically contained secure space, with direct access to an external secure courtyard sensory garden that can be used as a home-base by up to eight students with disability, their teacher and support teacher.

In all Learning Neighbourhoods students should have ready access to creative/investigative spaces including integrated external learning environments. Design solutions that explore each of the following options are encouraged.

**Option 1:** small creative/investigative spaces in each Learning Neighbourhood that accommodate from 12–15 students plus a more specialised Art space (visual and media arts) and a more specialised Science, Technology, Engineering, Arts and Maths (STEAM) space **for use by the whole school.**

**Option 2:** one multipurpose creative/investigative space per 75 students that accommodates up to 25 students as a group working with a teacher plus up to five students working on individual or a small group project.

## Withdrawal Spaces

Withdrawal is defined in the *Safe and Supportive Schools Policy* as time away from classroom activity in a calming area where doors are not locked and a student is not prevented from leaving.

The following guidelines should be applied for withdrawal spaces.

- Types of spaces to use for withdrawal include:
  - soft furnishings at the back of classrooms to make 'reading corners';
  - flexible learning spaces separate to other classrooms;
  - teepees or tents set up as quiet spaces;
  - outdoor recreation areas, such as gardens or playgrounds; and
  - specifically designed sensory spaces.
- Use of withdrawal spaces includes:
  - dedicated spaces at the back of classrooms that students can use for self-directed withdrawal;
  - establish rules of use and display these in the space;
  - staff must have line of sight to the student at all times or stay in the space with the student;
  - students must be able to see out of the space and know they are not locked in;
  - staff must be able to quickly intervene if the student requires assistance;
  - where withdrawal is used as part of a student's behaviour support, this strategy must be documented in a behaviour support plan including details of the space to be used and the staff providing support;
  - ensure there is a plan for returning the student to the classroom in a supported and timely way; and
  - withdrawal spaces must not have external locks and must not be for the sole purpose of confining students with challenging behaviour.

## Specific functional requirements

The specific functional requirements for Learning Neighbourhood/Learning Community spaces and settings are provided in Table 10.

<b>FUNCTIONAL UNIT:</b>	<b>Teacher Work Space</b>		
<b>FUNCTIONAL AREA:</b>	Primary School General Learning Communities		
<b>Indicative area:</b>	<b>Enrolment</b>	<b>450</b>	<b>600</b>
	m <sup>2</sup>	135	180

### Design Intent

Teacher workspaces provide a space where teachers can work individually and collaboratively to meet, engage in dialogue and discussion, design and plan, analyse student data together, access resources, write records, store resources and secure personal belongings. Although they might serve as a social and recreation space, they are not primarily intended for that purpose.

Ideally there is one Teacher Work Space per Learning Community (not one per Learning Neighbourhood) as the notion of a Learning Community is that the students and teachers in the Learning Community are grouped together as a community with related learning needs.

It is desirable that the teacher work area is highly visible to the Learning Neighbourhood areas to model both individual and collaborative teacher work to students and to enable passive supervision.

### Operational factors to consider

While providing a retreat from the main Learning Neighbourhood areas, the Staff Work Area needs to be readily accessed and have visibility to and from the Learning Neighbourhoods for access to resources and for line of sight supervision.

The Teacher Work Space might, at times, be used for meetings with parents.

Up to nine teaching staff need to be accommodated in a teacher work space within a Learning Community.

### Functional requirements

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

- individual work stations for each staff member;
- storage for resources—files, books, folders, other teaching resources;
- secure storage for individual belongings;
- a setting to support collaborative work; and
- display area for resources and a ‘data wall’ (display of student data tracking performance and progress).

#### 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 Neighbourhood area

##### Acoustics: [Technical Specification 14.3–14.4]

complete acoustic separation from adjacent spaces to ensure privacy

#### Fitout:

meeting table and chairs  
individual teacher work stations/desks with secure storage section  
individual storage shelves and under desk filing cabinet  
storage for Learning Neighbourhood/Community teacher resources

#### ICT: [Refer Technical Specification]

#### Security: [Technical Specification 5.10–5-11]

## 7.5 P-6 Specialist Facilities

<b>SCHOOL SECTION:</b>	<b>Primary School</b>
<b>FUNCTIONAL AREA</b>	P-6 SPECIALIST FACILITIES
<b>LOCATION:</b>	Integrated with other Functional Areas or centrally accessible

### Overview

Primary Schools tend towards integrating specialist facilities, such as facilities for visual art, into the Learning Neighbourhoods/Learning Communities as much as possible to facilitate a holistic approach to learning enabling students to learn through ‘head, hands and hearts’. This approach is not always appropriate when:

- learning in one specialist area might compromise learning nearby, e.g. the acoustic interference from Music;
- the specialist equipment is expensive or infrequently used and therefore does not warrant distributing through every Learning Community, e.g. robotics and other science, technology, arts, engineering and maths (STEAM) equipment; and
- the functional requirements cannot be provided easily in the Learning Neighbourhood/Learning Community, e.g. sprung floor for dance and gymnastics.

Accordingly, the functional requirements for the Arts (Visual, Performing and Media Arts), Health and Physical Education require some specialist Functional Areas and indicative area for each of these specialist facilities is stated separately.

### Functional Units for Primary School Specialist Facilities

- The Arts – Visual (2D and 3D) and Media Arts, Performing (Dance, Drama, Music);
- STEAM (Science, Technology, Arts, Engineering and Maths);
- Design and Technologies and Digital Technology; and
- Health and Physical Education.

### Operational factors to consider

Schools differ as to whether they have specialist teachers for the Arts, STEAM and Health and Physical Education. In one school a functional area that has been designed for Visual Art might be the ‘home’ for a specialist Art teacher and different groups of students move to this space for Art. Whereas in another school this space might be accessed by students in that Learning Community at the point of need for Art activities. The spaces must be designed to work for either staffing arrangement.

### Opportunities

Consider all opportunities for shared use of the specialist facilities with the Community and opportunities for integration with other functional areas e.g. Performing Arts with General Purpose Hall used for Health and Physical Education.

<b>FUNCTIONAL UNIT:</b>	<b>The Arts: Visual Art (2D &amp; 3D)</b>
<b>FUNCTIONAL AREA:</b>	Primary School Specialist Facilities
<b>Indicative area:</b>	Area for the visual arts has been incorporated into the overall indicative area provided for Primary School General Learning Communities.

## Design Intent

Curriculum requirements in the visual and media arts for the primary years include 2D and 3D Visual Art and Media Arts across Kindergarten to Year 6 with different requirements at each stage F–2, 3–4 and 5–6.

Schools adopt a wide range of forms for engaging students in the arts. In the visual arts, digital art, graffiti and co-created mosaics and murals supplement traditional forms of 2D and 3D art. Schools also differ with regard to the extent that Visual Art and Media are integrated with other curriculum domains, are programmed as standalone areas of the curriculum or a mixture of both approaches. They also differ as to whether they choose to dedicate a specific area for Visual Art depending on a number of factors—availability of specialist staff, curriculum philosophy and availability of space etc.

Regardless of the school's choices, it is envisaged that some of the learning spaces designed to support the Arts will be integrated into the Learning Neighbourhoods/Learning Communities while other learning spaces for the Arts may include some specialist spaces in order to meet the requirements of the Australian Curriculum or the school's resourcing.

Learning Settings for Visual Art are required to support learning and teaching activities in which students are involved in creating and making and exploring and responding as individuals, or in small and medium size collaborative groups. Students engage in design, ideas generation, skill learning and hands on interaction and exploration with art materials in order to create and make explore and respond.

### Opportunities:

Consider the opportunities for creating gallery displays for student artwork throughout the school—foyer spaces, external spaces, wall spaces and horizontal surfaces.

## Functional requirements – Visual Art 2D and 3D

To address the functional requirements for creative activities with 2D and 3D materials, the Learning Settings for Visual Arts with 2D and 3D must support the following learning and teaching activities for individuals, small large size groups:

- direct, explicit teaching, demonstration and presentation of art concepts and techniques;
- structured and free-form interaction and collaboration;
- creative activities with 2D and 3D art equipment and materials; and
- display of learning resources and student art work.

Visual Art workshop settings are the key functional requirements.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b></p> <p>ensure that the spatial layout allows sufficient space between groups for ease of movement and safe manipulation of materials and equipment</p> <p>provide uncluttered workspace(s)</p> <p>provide adaptable furniture configurations to provide workspaces to allow for different learning stages and learning activities</p> <p>support individual and small to medium sized groups working together collaboratively</p> <p>integrate the internal area with a protected external workspace</p> <p><b>connect to an adjacent gallery space/functionality for the display of student work</b></p> <p><b>Visibility:</b></p> <p>enable views to outside landscape features</p> <p>provide abundant natural light (but with capacity to moderate light levels)</p> <p>enable line of sight vision of activity in the setting from at least one adjacent area for passive supervision</p> <p><b>Acoustics:</b></p>	<p><b>Fitout:</b></p> <p>be at least semi-enclosed to create focus, purpose and order</p> <p>accessible workspaces to support inclusion of students with disabilities into the learning environment</p> <p>provide sufficient number, and distributed access, to troughs, sinks, water supply stations for the maximum number of people using the space so that congestion is avoided</p> <p>include side benches for holding equipment and resources and display</p> <p>provide large, adaptable bench/work areas of varying height to support all Users and to support a range of different activities while standing and/or sitting on stools</p> <p>provide a lockable store for the storage of equipment and supplies</p> <p>provide storage shelves and spaces for works in progress</p> <p>utilise appropriate stain and water resistant, non-slip flooring material</p> <p><b>ICT: [Refer Technical Specification]</b></p> <p>AV projection display of appropriate size for the viewing depth of the space</p> <p>Wireless coverage</p> <p><b>Security: [Technical Specification]</b></p>
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be equipped to suppress and control noise intrusion to and from adjoining areas

**FUNCTIONAL UNIT:** The Arts: Digital Media Arts

**FUNCTIONAL AREA:** Primary School General Learning Community

### Design Intent

Beyond the traditional modes of 2D and 3D Visual Art, Digital Media Arts employs learning and teaching activities in which students are involved in creating and making and exploring and responding as individuals, or in small and medium size collaborative groups. Students engage in design, ideas generation, skill learning and hands on interaction and exploration with digital media in order to create and make, explore and respond.

### Opportunities:

Consider opportunities for integrating some aspects of media arts into the Library/Interactive Learning Resource Centre for providing centralised access for the whole school and for maximising the potential for shared Community use.

A desirable feature for digital media technology area is a digital studio including green screen, media and broadcasting.

### Functional requirements – Digital Media Arts

To address the functional requirements for creative activities with digital media, the Learning Settings for digital media art must support the following learning and teaching activities for individuals, small and large size groups:

- direct, explicit teaching, demonstration and presentation of digital art concepts and techniques;
- structured and free-form interaction and collaboration;
- creative activities with digital media and other resources; and
- digital and hard copy display of learning resources and student creations.

#### Specific functional requirements

##### Spatial layout:

ensure that the spatial layout allows sufficient space between groups for ease of movement and safe manipulation of materials and equipment  
provide uncluttered workspace(s);  
provide adaptable furniture configurations to provide workspaces to allow for different learning stages and learning activities  
support individual and small to medium sized groups working together collaboratively with digital media and equipment

##### Visibility:

controllable lighting  
enable line of sight vision of activity in the setting from at least one adjacent area for passive supervision

##### Acoustics:

be equipped to suppress and control noise intrusion to and from adjoining areas

#### Fitout:

be at least semi-enclosed to create focus, purpose and order  
accessible workspaces to support inclusion of students with disabilities into the learning environment  
space so that congestion is avoided  
include side benches for holding equipment and resources and display  
workspaces for individual and small to medium size groups  
working with digital equipment and paper/print material  
projection/display for medium and large groups;  
display boards  
effective control of noise intrusion to and from adjoining areas  
controllable lighting  
line of sight vision of activity in the setting from at least one adjacent area for passive supervision  
lockable storage

#### ICT:

wireless coverage  
data and power distributed to support AV display for collaborative work in small groups  
AV projection display appropriate to the viewing depth of the room

**Security: [Refer Technical Specification]**

<b>FUNCTIONAL UNIT:</b>	<b>Performing Arts Music</b>		
<b>FUNCTIONAL AREA:</b>	Music facilities attached to the General Purpose Hall		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m2	114	126

### Design Intent

The Learning Settings for Music are required to support learning and teaching activities in which students are involved in creating and making and exploring and responding using their voices, musical instruments, improvised equipment and digital technologies. The main learning activity focus involves engaging in creative expression activities with musical instruments.

### Opportunities:

Consideration should be given to a range of internal and external performance spaces for Music (as well as Dance and Drama). Desirable features include:

- enabling the Music learning space to be used as a performance venue by operable wall connection(s) to adjacent internal and/or external spaces that can accommodate an audience. If a Music space opens into the General Purpose Hall, the preferred location is on the narrower wall so that everyone in the audience can view the activity in the space. If an operable wall is used to connect to an internal space it must be soundproof; and
- small and large external amphitheatre settings.

### Functional requirements – The Performing Arts

Learning Settings for Music must support individuals to large groups engaging in listening, developing instrumental skill and developing ideas through improvising and composing and performing. To address the functional requirements for creative activities in Music, the Learning Settings for Music must support the following learning and teaching activities for individuals, small and medium size groups:

- direct, explicit teaching, demonstration and presentation;
- structured and free-form interaction and collaboration;
- creative activities with musical equipment; and
- rehearsal and performance.

The facilities for Music are required to:

- accommodate a group of approximately 25-30 students using a range of musical instruments of varying sizes;
- include acoustically contained rooms (two for LTE 450, three for LTE 600) that can serve the dual purposes of use for individual and /or small group rehearsal and practice and as recording/editing rooms with visual and digital connection to the music space. At least one of these spaces must be able to function as a recording studio;
- include internal and external performance space(s); and
- provide secure storage for storing class sets of musical instruments and assorted equipment of varying shapes and sizes.

Opportunities:

Consideration should be given to a range of internal and external performance spaces for Music (as well as Dance and Drama). Desirable features include:

- enabling the Music learning space to be used as a performance venue by operable wall connection(s) to adjacent internal and/or external spaces that can accommodate an audience;
- if a Music space opens into the General Purpose Hall it is preferred that it is located on the narrower wall so that everyone in the audience can view the activity in the space;
- developing settings and spaces that support the Media Arts in addition to Music; and
- providing a variety of small and large external amphitheatre settings.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> facilitate ease of movement of musical instruments ensure readily adaptable layout to accommodate different sized groups</p> <p><b>Visibility:</b></p>	<p><b>Fitout:</b> provide accessible spaces to support inclusion of students with disabilities into the learning environment be supported by an appropriate number of power and data outlets secure storage totalling minimum 10m<sup>2</sup> must be provided</p> <p><b>ICT: [Refer Technical Specification]</b></p>
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<p>line of sight passive supervision throughout the learning spaces</p> <p><b>Acoustics:</b> be able to be acoustically contained bounded by soundproof walls, doors and with acoustic treatment to moderate noise level and reverberation in the space as in accordance with the requirements of the Technical Specification</p>	<ul style="list-style-type: none"><li>• power and data outlets to service digital music equipment and AV display</li><li>• wireless coverage</li><li>• AV</li></ul> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Performing Arts: Drama and Dance</b>
<b>FUNCTIONAL AREA:</b>	Primary School General Learning Community, General Purpose Hall.
	No separate indicative area specified. Facilities for Music, the General Purpose Hall and internal and external settings serve multiple purposes including Performing Arts: Drama and Dance.

### Design Intent

The Learning Settings for Drama are required to support learning, teaching and performance activities in which students are involved in creating, making, exploring and responding using their bodies, voices, props and digital technologies.

### Opportunities:

Drama and Dance learning experiences can be provided in a range of internal and external rehearsal and performance areas. Multi-purpose learning environments that can be used for Drama and/or Dance include:

- the functional area for Music;
- the General Purpose Hall if it is equipped with a sprung floor for dance (See specific functional requirements for Physical Education and Health);
- a stage, which if it is intended to be used for dance, must accommodate a dance troupe;
- a performance or presentation area in the Learning Communities that has tiered seating;
- external amphitheatre; and
- external stage.

The design must identify the settings that are intended to be used for Drama and Dance.

### Functional requirements – Drama

Learning Settings for Drama and Dance must support individuals to large groups engaging in watching, developing skills and developing ideas through improvising, creating and performing. To address the functional requirements for creative activities in Dance and Drama, the Learning Settings must support the following learning and teaching activities for individuals and small to large size groups:

- direct, explicit teaching, demonstration and presentation;
- structured and free-form interaction and collaboration;
- creative activities involving interaction, use of voice and body movement; and
- rehearsal and performance.

The design, layout and fit out of the Functional Area(s) for Dance and Drama must take into account the acoustic, lighting, resource access, spatial layout, and physical comfort factors that will maximise the effectiveness of spaces for their intended purposes.

Operational factors to consider:

Consideration should be given to maximising the storage space for Drama. Large storage areas adjacent to performance spaces support the storage of props.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> adaptable space for open floor and /or the use of props</p> <p><b>Visibility:</b> line of sight passive supervision throughout the space</p> <p><b>Acoustics:</b> be able to be acoustically contained, bounded by soundproof walls, doors and with acoustic treatment to moderate noise level and reverberation in the space as in accordance with the requirements of the Technical Specification</p>	<p><b>Fitout:</b> large storage area with some open shelves for props and costumes Sprung floor</p> <p><b>ICT: [Refer Technical Specification]</b> wireless coverage AV display capability</p> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Environmental Science and STEAM (Science, Technology, Engineering, Arts and Maths) Centre</b>		
<b>FUNCTIONAL AREA:</b>	Primary School Specialist Facility		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	105	105

### Overview

The integration of Science Technology Engineering Arts and Maths (STEAM) is a priority of the Territory. It acknowledges the increasing importance of Maths and Science for employment and life, the pervasiveness of Maths in many new areas and the need for quality resources for these curriculum areas. To fulfill the requirements of the Australian Curriculum–Science and Design and Technologies and Digital Technologies, students from Kindergarten to Year 6 need to be actively engaged in science inquiry, authentic problem solving and design with digital technologies.

Sustainability is also a key cross curriculum understanding specified in the Australian Curriculum and Environmental Science is an important aspect of developing understanding in relation to creating a sustainable future.

### Design Intent

The Learning Settings for Science are required to support learning and teaching activities in which students are involved in hands on investigations. To address the functional requirements for learning activities in Science, the Learning Settings must support the following learning and teaching activities for individuals and small to large size groups:

- direct, explicit teaching, demonstration and presentation;
- structured and free-form interaction and collaboration;
- investigative activities with general science equipment and materials inside and outside;
- construction, modelling and simulation with digital technologies and in authentic settings; and
- display of learning resources and student work.

The design, layout and fit out of the Functional Area(s) for Science must take into account the acoustic, lighting, resource access, spatial layout, and physical comfort factors that will maximise the effectiveness of spaces for their intended purposes.

Functional elements to support learning through a range of creative and investigative activities in STEAM must be distributed and integrated within the Learning Communities. Equipping a creative investigative area with mobile trolley storage for different sets of resources and equipment can enhance dual use.

### Opportunities:

In addition to the minimum requirement of distributed investigative spaces in the Learning Communities, a specific functional area that supports 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 K–6.

There is potential for a kitchen to be integrated with the shared use Multipurpose that is connected to the Library/Interactive Learning Resource Centre. A kitchen where preparation, cooking and eating can occur promotes a healthy lifestyle and healthy food habits.

### Functional requirements – STEAM Centre

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> spacious, flexible layout to provide adaptability for different projects and activities ability to create open floor space for construction, modelling and robotics readily accessible, walk in storage.</p> <p><b>Visibility:</b> controllable lighting line of sight visibility throughout the STEAM centre and to external learning environments</p> <p><b>Acoustics:</b> be equipped to suppress and control noise intrusion to and from adjoining areas</p>	<p><b>Fitout:</b> a mix of standing and sitting height benches mobile under bench equipment trolleys storage for a range of materials and equipment trough sink</p> <p><b>adequate ventilation for the equipment installed (vacuum formers, laser cutters etc )</b></p> <p><b>ICT:</b> WAP coverage distributed data and power to provide ready access from work benches AV</p> <p><b>Security: [Refer Technical Specification 5.10–5-11]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>Technologies: Design and Technologies and Digital Technologies</b>
<b>FUNCTIONAL AREA:</b>	Distributed through General Learning Communities, STEAM, Digital Media Arts

### Design Intent

Design and Technologies and Digital Technologies involve design, make and appraise activities with a range of materials and equipment. Potential materials and equipment include wood, metal, plastic and electronics. Digital technology has a strong focus on computational thinking and thinking about how to frame problems that can be solved through computation.

In K–2 a learning program is designed that draws on the Technologies and is largely integrated with other curriculum domains. In Years 3–6 schools are required to develop a Technologies program that includes in each two-year band of schooling both Design and Technologies and Digital Technologies.

### Opportunities:

In Primary Schools Design and Technologies and Digital Technologies provides a wonderful opportunity for authentic integration of the curriculum through problem solving, design challenges and authentic investigative projects.

### Functional Requirements:

To address the functional requirements for Design, make and appraise activities with Technologies, the Learning Settings for the Design and Technologies and Digital Technologies must support design, make and appraise activities. Distributing and integrating Functional Elements that support a range of creative and investigative activities, including Technology activities, within the K–6 Learning Communities and the STEAM Centre, could achieve this for Years K–6. Equipping creative investigative areas in the Learning Neighbourhood/Learning Communities with mobile trolley storage for different sets of resources and equipment can enhance dual use.

The following learning and teaching activities for individuals, small and large size groups must be supported:

- direct, explicit teaching, demonstration and presentation;
- structured and free-form interaction and collaboration and indoor games;
- creative activities with media, digital equipment, robotics, electronics and 3D printers;
- creative activities with wood, metal, plastic and other materials;
- investigative activities with digital equipment and materials;
- design, construction, modelling and simulation with digital equipment and a range of materials;
- display of learning resources and student designs and products; and
- quiet reflective activities and/or individual research.

#### Specific functional requirements

##### Spatial layout:

support students working together collaboratively with digital media and equipment

##### Visibility:

controllable lighting

##### Acoustics:

be equipped to suppress and control noise intrusion to and from adjoining areas

#### Fitout:

a mix of standing height and sitting height work tables  
stools and seats to suit height of benches

#### ICT:

distributed power and data outlets to support ease of access  
WAP coverage

#### AV

#### Security:

<b>FUNCTIONAL UNIT:</b>	<b>Languages</b>
<b>FUNCTIONAL AREA:</b>	Distributed through the Primary School General Learning Communities

## Overview

Language learning in Kindergarten to Year 4 is laying the foundations for learning a second language. For language learning at this age, it is recommended that language is adapted to students' direct needs in which students are immersed in communication tasks that are engaging, relevant, well designed and directly linked to their general learning experiences – all areas of the curriculum are able to support the learning of a second language. Language education is best integrated into other curriculum areas. Years 5-6 are seen as an extension of laying the foundations with a particular emphasis on students beginning to initiate communication and follow personal interests and ideas. Access to a wider range of interlocutors (such as native speakers and other students of similar age) becomes important via direct and virtual communication.

## Design Intent

Language learning in K–6 is best supported in the Learning Neighbourhood and Learning Community rather than requiring a separate functional area.

## Functional requirements – Languages

Language learning is supported by the functionality briefed for the Learning Neighbourhoods/Learning Communities.

Functionalities that support rehearsal and performance include:

- settings for individual and small group rehearsal and virtual communication; and
- an acoustically isolated space that can accommodate a group of approximately 25 students.

The design, layout and fit out of the Learning Settings for the Learning Neighbourhoods/Learning Communities must take into account the acoustic, lighting, resource access, spatial layout, and physical comfort factors that will maximise the effectiveness of spaces for language learning.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Video Conferencing room - enable all participants to be included in VC camera range</p> <p><b>Visibility:</b> controllable lighting</p> <p><b>Acoustics:</b> be equipped to suppress and control noise intrusion to and from adjoining areas</p>	<p><b>Fitout:</b> distributed collaborative spaces for small group learning and rehearsing agile adaptable fit out of space that accommodates up to 25 students; to facilitate ease of movement between seated activities and role plays or rehearsals storage for language learning equipment and resources</p> <p><b>ICT:</b> multiple data points (plug in connections for data and telephony and wireless data) distributed AV display screens for individual and small group collaboration projection/display for medium, large group and neighbourhood size groups at least one space per Learning Community suitable for small to medium sized groups that can be used to engage in virtual conferencing WAP coverage</p> <p><b>Security:</b> [ Refer Technical Specification]</p>
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## Health and Physical Education

<b>SCHOOL SECTION:</b>	<b>Primary School</b>		
<b>FUNCTIONAL AREA</b>	Health and Physical Education		
<b>LOCATION:</b>	Distributed across Learning Communities, the General Purpose Hall, and External Learning Environments		
<b>Indicative Area:</b>	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	870	870

### Overview

The Health and Physical Education requirements of the Australian Curriculum provide students with the knowledge, skills and behaviours necessary for the pursuit of lifelong involvement in physical activity, and for the maintenance of health and wellbeing. It provides students with knowledge, skills and behaviours to enable them to achieve a degree of autonomy in developing and maintaining their physical, mental, social and emotional health. This domain focuses on the importance of a healthy lifestyle and physical activity in the lives of individuals and groups in our society

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 involves providing Functional Areas that support engaging in physical activity, games, sport and outdoor recreation. The General Purpose Hall and the outdoor hard court and the open sports field provide Functional Units for a range of formalised games and sports.

### Opportunities

Functional Elements that promote physical activity, the development of motor skills and movement competence can be incorporated into many physical features of the buildings and external areas. Consideration should be given as to how elements such as steps could serve to provide and encourage specific physical activities. In addition consideration should be given to how a range of sports related activities could be incorporated using the walls (handball, tennis practice wall), half court basketball/netball with practice rings, indoor cricket and soccer etc.

Functional Units required for Health and Physical Education:

- General Purpose Hall with Public entry lobby, school and community storage and associated amenities;
- External Learning Environments – Hard Courts and Sport Playing Fields.

### Operational factors to consider

Schools differ as to whether they have specialist teachers for Health and Physical Education. Providing some space that can support Health and Physical Education teachers, whether specialist or generalist, in terms of workspace and resource storage space is necessary. Community members and groups will use many of the Functional Units for Health and Physical Education. In designing the Health and Physical Education Facilities it is important to consider access and security issues.

### Opportunities

Consider all opportunities for shared use of the specialist facilities with the Community and opportunities for integration with other functional areas e.g. Performing Arts with General Purpose Hall used for Health and Physical Education.

A Multipurpose space that connects the General Purpose Hall and Library/Interactive Learning Resource Centre so that the kitchen functionality required in the Multipurpose Room can support the dual purposes of healthy eating programs and catering for performances and events.

### Functional Relationships

The General Purpose Hall must be located in close proximity to the hard and soft outdoor sports and playing areas and the car park.

<b>FUNCTIONAL UNIT:</b>	<b>Indoor Physical Education</b>		
<b>FUNCTIONAL AREA:</b>	General Purpose Hall		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	820	820

### Design Intent

In addition to providing an area for indoor physical education, the General Purpose Hall will also be used for team court sports, gymnastics, dance and drama, general school assemblies, other functions requiring a large assembly area, and Out of Hours Use by the local community for before and after school care, community events and sports competitions.

#### Opportunities:

There is an opportunity to develop a food and drinks preparation area connected to the foyer that can be utilised for after school hours care program. This function could also be utilised for catering for functions in the General Purpose Hall.

### Operational factors to consider

Zoning for use out of school hours by the school or by Community users.

After school hours care requires access to a kitchenette and furniture for serving snacks and drinks. It is important that this area can be set up and put away quickly. Storage for foldable tables and stackable chairs should be considered and a kitchenette that can be secured. Depending on the design, there may be opportunities to integrate or adjoin this function with the canteen facilities.

Control of noise generated by activities in this space and adjacent to this space noting the potential for this element to be used not only during the school day but outside of school hours, and during evenings, the design must limit the leakage of sound that may cause nuisance to neighbours.

### Functional requirements

To support the total range of activities the General Purpose Hall will be used for, several functional requirements must be met:

- large indoor sports hall sufficient to accommodate full size basketball court, overlaid with full size netball court, volleyball, badminton and futsal, bounded by competition standard run-off spaces and with additional space for court-side spectators;
- suitable for use as the audience area for school assemblies or by Community user group using a stage facility (fixed, portable or retractable) or an adjacent function;
- suitable for use as the seated audience area for performances/ presentations by school;
- public entry lobby
- kitchenette facilities for after school hours care;
- storage for after school hours care furniture and equipment; and
- close proximity to the hard and soft outdoor sports and playing areas.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> critical plan dimensions and height for sports activities minimum floor to ceiling height of 6.0m throughout the room is to be provided taking into account an even distribution of natural light and natural ventilation across the whole floor area a minimum 2.0m width perimeter run-off space to all sides of the largest court and with a 3.05m wide umpire zone to one long side of the netball court</p> <p><b>Visibility:</b> line of sight viewing all seating areas to and from stage abundant natural lighting allow for separate control of artificial lighting, to complement varying levels of natural lighting within the area visibility of internal activity from external and/or adjacent spaces</p> <p><b>Acoustics:</b> control of noise leakage from this space</p>	<p><b>Fitout:</b> robust walls to 2.1m height robust fittings, fixtures and lighting basketball rings and backboards floor sockets for netball goal posts court line-marking in different colours to delineate the accommodated sports courts impact padding staging must be fully accessible to all users. preferably, stage is located on the narrower wall to provide best audience view lines from every position in the General Purpose Hall loose fitments required include the requisite goals, posts, nets and the like needed to configure the courts for the identified sports. relevant sockets and fittings must be incorporated into the floor to enable all these sports as a minimum to be undertaken Adequate heating Lockable kitchenette for After School Hours Care – Microwave, fridge Bench for food preparation</p>
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<p>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</p> <p><b>Hydraulics:</b> there will be toilet and change room facilities required in this building for use by both the school and the community.</p>	<p>Sink and hot and cold running water for clean-up facilities</p> <p><b>ICT:</b> Wireless coverage data points proximate to stage area. Audio visual and projection system for music and drama performance suitable for the size of the space, 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</p> <p><b>Security:</b> locking to all doors and shutters</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Sports Equipment Store</b>		
<b>FUNCTIONAL AREA:</b>	<b>Indoor Physical Education</b>		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	50	50

### Design Intent

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

### Operational factors to consider

Direct adjacency to and connection with the General Purpose Hall.

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

Convenient access for deliveries.

Security for stored equipment – on basis that Sports Equipment Store will be shared with Community Users

### Functional requirements

Fitted joinery, bins, racks, pigeon holes and adjustable shelving for storage of the schools sporting equipment and physical education resources including:

- balls, footballs, basketballs, class sets of tennis rackets, ball pumps, cricket equipment;
- free-standing goals, nets and net posts for indoor sports (netball, badminton); and
- oval line marking machine.

Open floor space for storage of large items such as:

- stacked gym mats;
- seating storage;
- racked mobile staging;
- vaulting horses, springboards, mini-trampolines, balance beams, parallel bars;
- gated and lockable steel framed and steel mesh security cages around the school's storage of small items of sports equipment;
- provision of four similar small gated and lockable steel framed and steel mesh security cages, with integral fixed shelving, each 0.8m<sup>2</sup> in plan and 2.4m height, providing secure storage for sports equipment belonging to future community groups;
- roller shutter doors connecting this space to the General Purpose Hall and to the exterior of the building; and
- single pedestrian access door connecting this space to the General Purpose Hall or a corridor.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Wall mounted storage and clear floor area for additional storage.</p> <p><b>Visibility: N/A</b></p> <p><b>Acoustics:</b> ensure that impact on the roller doors by ball sports do not create acoustic issues.</p> <p><b>Hydraulics:</b></p>	<p><b>Fitout:</b> Fitted joinery, cages and racking as described Whiteboard and pin board Durable floor – resilient to scraping (e.g.: concrete with epoxy sealer coat) Waste bin</p> <p><b>ICT:</b> Telephone/ data point</p> <p><b>Security:</b> Locking to all doors and shutters PIR/ Intruder detection Independent community access</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Amenities</b>		
<b>FUNCTIONAL AREA:</b>	<b>Indoor Physical Education – General Purpose Hall</b>		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	Meet or exceed BCA requirements		

### Design Intent

The male and female change rooms are to be designed to double as team change rooms to support competitive team sports when used out of hours.

### Operational factors to consider

These change rooms will be used by adults and children.

### Functional requirements

- Male and Female student change rooms and toilets with lockers.
- A single, unisex, fully accessible bathroom (toilet, shower, hand basin) for students.
- Two single, unisex, fully accessible bathroom (toilet, shower, hand basin) for staff.
- Cleaner's room.

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 over time.

Disabled and visitor toilets are to be unisex.

### Specific functional requirements

As per BCA requirements

## External Learning Environments

<b>SCHOOL SECTION:</b>	<b>Whole School – Preschool and Primary School</b>
<b>FUNCTIONAL AREA</b>	External Learning Environments
<b>LOCATION:</b>	All external areas of the school

**NOTE:** *In the past, external learning settings have tended to be considered as dispensable. As soon as budgets get tight the external settings are the first to be cut. **This Functional Brief takes the opposite stance.** External learning settings are essential to achieve the full functional requirements of the Functional Brief.*

### Overview

External environments are an **integrated, enriching component of the total learning environment**. External learning environments must be designed to:

- provide opportunities for students to exercise choice and test boundaries;
- provide spaces that support community building;
- provide spaces that extend the Learning Neighbourhood 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 students to stretch themselves;
- support environmental, sustainability and science, technology and maths education;
- inspire creative works – art and writing;
- provide social, recreational space; and
- provide spaces for small scale and large scale outdoor performances – impromptu and planned.

### Functional Units for External Learning Environments

- External learning settings integrated with internal Learning Neighbourhood settings.
- External performance spaces – stage, amphitheatre, tiered seating.
- Productive Garden.
- Sports playing fields.
- Hard courts.
- Play spaces and play equipment (with appropriate shade structures).
- Passive recreation and socialising spaces.
- Retreat spaces.

### Guidelines for designing external Learning Settings

The process of design of the external learning settings must be integrated with the design of the internal learning settings. They are not an 'add on'. The external learning settings are required to:

- address the functionalities described above in the overview;
- support students of different ages;
- support student socialising opportunities;
- give equal attention to passive and active recreation zones;
- consider what opportunities architectural features such as steps and stairs provide for gross motor activities;
- use natural, free form elements when possible;
- be inclusive and support and enhance the experience of students with special needs;
- include settings that are designed to support students with special needs to withdraw and/or self-regulate; and
- provide adequate seating and shaded /covered areas.

**Operational factors to consider**

All external areas are required to be supervised by school staff. Line of sight passive surveillance of all readily accessible and highly active external areas is required. Minimising the number of staff on supervision duty is desirable.

<b>FUNCTIONAL UNIT:</b>	<b>Learning Neighbourhood External Learning Settings</b>
<b>FUNCTIONAL AREA:</b>	Primary School General Learning Community
<b>INDICATIVE AREA:</b>	1.5m <sup>2</sup> /student

### Design Intent

At a minimum, each Learning Neighbourhood is required to have directly accessible External Learning Areas that serve as annexes to the internal settings and integrate internal and external spaces.

For the Learning Community closest to the Preschool and that is likely to be used for K–2, a directly accessible outdoor play area is required. The possibility of having a play zone for the Preschool and K–2 that can be wholly or partly shared is another possibility that should be explored.

### Operational factors to consider

The External Learning Courtyard associated with the spaces that are designed to support students with disability is required to serve a range of needs students with disability and careful consideration needs to be given to the design of this courtyard.

### Functional requirements

External Learning Settings are required for:

- ‘wet, messy activities’ adjoining;
- indoor creative, investigative areas;
- construction and creative projects;
- small garden projects;
- small to large group discussions/performances; and
- quiet reflection and/or reading areas, adjoining similar areas internally.

The location, layout and fit out of the external courtyard servicing the Learning Neighbourhood area that supports students with disability is required to:

- be inclusive;
- deliver a unified design aesthetic consistent with the whole school environment; and
- flexible in scale and layout.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> include an area that can support students in self-regulating</p> <p><b>Visibility:</b> line of sight passive supervision from within the adjacent Learning Neighbourhood space</p> <p><b>Acoustics: N/A</b></p>	<p><b>Fitout:</b> a range of play equipment and play spaces to suit the age hard surfaces suitable for fixed and moveable furniture Level changes and planting to define area and provide fixed seating and performance opportunities Use materials that absorb and radiate heat Provide natural shade and shelter from prevailing winds Include infrastructure in the form of hosecocks, small water tanks, raised planters as education aids specific play equipment and sensory rich materials for students with disability removable walls/screens to varying area</p> <p><b>ICT:</b> Wireless coverage</p> <p><b>Security: [Refer Technical Specification]</b></p>
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<b>FUNCTIONAL UNIT:</b>	<b>External Learning Courtyard</b>
<b>FUNCTIONAL AREA:</b>	Primary School General Learning Community

### Design Intent

External environments are an integrated component of the total learning environment. The External Learning Courtyard for the Learning Community building provides opportunities for students to exercise choice, engage in physical activity, test their limits and enjoy a degree of freedom. Each Learning Community should have access to one safe, secure external learning environment that serves as an annex to the facilities that can serve as the Learning Neighbourhood for students with disability for physical and imaginative play, quiet reflection, reading/writing, small garden projects, and construction and wet/messy activities.

The design of the external courtyard must be integrated into the overall design of the Learning Community building. Consideration should be given to creation of a courtyard by designing the building form to incorporate an internal courtyard and/or return walls. Effective landscaping can be used to provide vegetation and feature screen and textured fences to achieve a welcoming look and feel.

### Opportunities:

There is an opportunity to incorporate rich sensory elements into the design and landscaping of the external courtyard. In addition, consideration could be given to the development of small sensory gardens, that can be readily accessed by all students, in close proximity to the external courtyards.

### Operational factors to consider

Given that the External Learning Courtyard is required to serve a range of needs of students with disability careful consideration needs to be given to the design of this courtyard.

### Functional requirements

External learning settings provide:

- spaces for imaginative and free form play such as sandpits, cubby-house;
- exposure to natural materials and natural processes;
- enable discovery in nature with natural materials;
- enrich the sensory environment through the use of a range of materials and a sensory garden;
- support gross motor development;
- practise gross motor skills;
- present physical challenges;
- inspire creative works – art and writing;
- social, recreational space;
- spaces for small scale outdoor performances – impromptu and planned;
- a comfortable microclimate; and
- a safe, secure external area.

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

- be inclusive; and
- deliver a unified design aesthetic consistent with the whole school environment.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> sufficient zoning and space between zones to avoid interference include an area that can support students in self-regulating</p> <p><b>Visibility:</b> line of sight passive supervision from within the adjacent Learning Neighbourhood space. Can be supervised from the playground areas.</p> <p><b>Acoustics: N/A</b></p>	<p><b>Fitout:</b> a range of play equipment and play spaces to suit the age specific play equipment and sensory rich materials for students with disability varied materials and textures to the ground and vertical planes vegetation of varying scales to create interest walls that absorb and radiate heat Natural shade fixed integrated seating removable fences to increase or decrease area removable screens to increase or decrease external views view portals hose cock</p> <p><b>ICT: [Refer Technical Specification]</b></p> <p><b>Security: [Refer Technical Specification]</b></p>
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## Canteen facilities

SCHOOL SECTION:	Primary School		
FUNCTIONAL AREA	Canteen Facilities		
LOCATION:	Adjoining the General Purpose Hall		
Indicative Area:	Permanent buildings provided for an enrolment of:	<b>450</b>	<b>600</b>
	m <sup>2</sup>	68	83

### Overview

The canteen will be the location where food is prepared for sale and consumption, including making meals from raw ingredients, making meals in quantity for distribution to school learning communities, storing packaged foods and drinks ready for sale, and preparing food items for display and counter sale. The menu will be simple, including soups, sandwiches, warmed foods (pies, etc.), fruit, and drinks. The Directorate supports healthy food options, so there will be an emphasis on fruit and food prepared from fresh ingredients. It is essential that the canteen complies with relevant Quality Standards and Laws for premises where food is prepared for sale from core ingredients.

The canteen will have a service counter opening to an external sheltered space with the external eave sized to provide all weather shelter for students queuing for service. The service counter must be able to cater to the needs of students of all year levels and the servery area must be designed to avoid student crowding so as to discourage bullying and other antisocial behaviour. The principles of inclusion must inform the design for this space, so that the service counter is accessible to any user. Generally, students at mid-morning recess and at lunchtime will use the canteen. Canteen staff will generally work in the Canteen from morning through to early afternoon.

Functional Units required for the Canteen:

- Canteen preparation area.
- Canteen servery area.
- Food store.
- Staff toilet.
- Staff change room.
- Office work area.
- Secure delivery area.

### Operational factors to consider

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. Ideally it will be adjacent to a whole school gathering space. If it is possible, given the vertical distribution of functional areas, it will also be adjacent to or linked with the lobby of the General Purpose Hall and/or outdoor covered court so that it can serve school and community purposes.

### Opportunities

The canteen will also be used as a food and beverage preparation and service/ sales area when the General Purpose Hall is used for school or community functions. The canteen must be located adjacent to a wide section of corridor or the lobby serving as the public entrance to the General Purpose Hall, and connected to that internal space via a servery hatch with a lockable metal roller shutter.

There is an opportunity to integrate the Canteen and the Multipurpose Room in the Library/Interactive Learning Resource Centre to provide a multifunctional area for students to prepare and eat healthy foods, using products from their productive garden.

### Functional Relationships

The canteen must be located centrally in the school, facing the central outdoor space.

<b>FUNCTIONAL UNIT:</b>	<b>Canteen Preparation Area</b>		
<b>FUNCTIONAL AREA:</b>	Canteen		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	35m <sup>2</sup>	50m <sup>2</sup>

## Design Intent

Food preparation and sale.

## Operational factors to consider

Efficient layout to support sequential preparation and assembly of food items.

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

Safe work environment – slip resistant floors, good lighting, ventilation

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

## Functional requirements

The Canteen Preparation Area will include the following functional units:

- worktops;
- below bench storage and overhead storage;
- washing up area;
- cooking area;
- refrigeration and freezing facilities;
- hand wash facilities; and
- waste disposal.

Adequate power outlets must be suitably located and distributed around external walls. 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 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.

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

- receiving deliveries of foods and drinks;
- removal of kitchen waste, wheelie bins, etc.; and
- direct access by staff into the canteen without entering the school interior

### Specific functional requirements

#### Spatial layout:

sufficient space for 2-3 people to work and circulate  
ready transfer of food between preparation area and servery  
direct access to canteen without entering school interior  
unobstructed area to receive deliveries and removal of waste

#### Visibility:

line of sight to external service counter

Acoustics: [Refer Technical Specification]

work place health and safety: noise control at exhaust hood

**Hydraulics:** [Refer Technical and FF&E Specifications]

H&C potable water

chilled and boiling water unit

sinks

dishwasher (plumbed to waste)

floor waste

hands free hand basin

service to all work benches

#### Electrical:

adequate power outlets to service equipment distributed around external walls and to bench tops including island benches if included

**Fit out:** [Refer Technical and FF&E Specifications]

resilient flooring – self coved skirting

fitted joinery/ commercial grade benchtops (stainless steel or

equivalent) / storage under and over

storage for chemicals, cleaners

clock

whiteboards and display pinboards

fire extinguisher

fire blanket

servery hatch and counter opening to internal space

waste bins to suit sorting of waste

sized for volume of waste generated regularly

refrigerators, freezers

oven, cooktop and exhaust hood

microwave oven(s)

commercial dishwasher

two bowl stainless steel sink

soap and hand sanitiser dispensers

paper towel dispensers

**ICT:** [Refer Technical Specification]

telephone/ data point

**Security:** [Refer Technical Specification]

locking to all doors and shutters

security for stock

PIR/ Intruder detection – key pad at entry door to isolate

Canteen zone

<b>FUNCTIONAL UNIT:</b>	<b>Canteen Servery</b>		
<b>FUNCTIONAL AREA:</b>	Canteen		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	15	15

### Design Intent

Food service to students

### Operational factors to consider

Access to the canteen servery can be intense for short periods of the day. Wide servery benches and a spacious forecourt facilitate ease of movement and prevent overcrowding.

### Functional requirements

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

- Display and present all foods and drinks, within easy reach of canteen servery staff.
- Display a list of food choices (menu) with prices.
- Provide external counter space for service of multiple students.
- Provide security when not in use, via a lockable metal roller shutter.

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> sufficient work and circulation space to permit unencumbered movement between servery counter, canteen preparation area, food storage areas provide servery counter to accommodate three abreast</p> <p><b>Visibility:</b> line of sight back to food prep area Acoustics: N/A</p>	<p><b>Fitout: [Refer Technical and FF&amp;E Specifications]</b> resilient flooring – self covered skirting wall mounted menu &amp; prices board fitted joinery/ benchtops/ storage under/ lockable cash drawer or space for cash register appliances (fridges/ freezers/ microwaves/ pie warmers/ heated counter display cabinets/ ) bug zapper waste bins</p> <p><b>ICT: [Refer Technical and FF&amp;E Specifications]</b> telephone data point for cash register/ point of sale device</p> <p><b>Security:</b> locking to all doors and shutters security for stock PIR/ Intruder detection – key pad at entry door to isolate Canteen zone</p>
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<b>FUNCTIONAL UNIT:</b>	<b>Canteen Store</b>		
<b>FUNCTIONAL AREA:</b>	Canteen		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	10	10

**Design Intent**

Storage of ingredients, raw materials and dry goods.

**Operational factors to consider**

N/A

**Functional requirements**

- Storage of a wide range of fresh and packaged foods, bulk dry goods, bottles, cans, frozen foods and the like.
- Maintainability – easy to clean.
- Meet manufacturer's storage conditions for packaged food, support extended shelf life for fresh foods.

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

adjacent to the Canteen food prep area  
convenient path from 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:**

adjustable stainless steel racking and shelving along walls  
impervious easily cleaned wall surfaces  
resilient flooring – self covered skirting  
large refrigerator  
chest or upright 2 door freezer

**Security:**

Lockable solid core door.

<b>FUNCTIONAL UNIT:</b>	<b>Canteen Staff change room and toilet</b>		
<b>FUNCTIONAL AREA:</b>	Canteen		
<b>Indicative area:</b>	Permanent buildings provided for an enrolment of:	450	600
	m <sup>2</sup>	8	8

### Design Intent

To provide change room and toilet amenities for Canteen staff.

### Operational factors to consider

Use by multiple staff members – up to 6.

### Functional requirements

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

<p><b>Specific functional requirements</b></p> <p><b>Spatial layout:</b> Integrated staff change room and toilet facility</p> <p><b>Visibility: N/A</b></p> <p><b>Acoustics:</b> Privacy - Acoustic insulation to bounding walls</p> <p><b>Hydraulics:</b> WC with in-wall cistern Inset hand basin Floor waste</p> <p><b>Mechanical:</b> Exhaust ventilation</p>	<p><b>Fitout:</b> impervious easily cleaned wall surfaces resilient flooring – self coved skirting Vanity bench with storage cupboard under Mirror Soap dispenser Paper towel dispenser Waste bin Toilet paper holder Sanitary bin Clothes lockers (minimum of 4) Bench seat Pin boards/ for notices Coat hooks</p> <p><b>Security:</b> Privacy latch</p>
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**Bicycle Storage:**

The facility must be designed to support and encourage sustainable and healthy commuting by students and staff. Secure fenced and roofed bicycle storage is required for students and separately for staff, in locations convenient to users. It is desirable for the staff bicycle store to be proximate to the Administration building, and the staff car park. The site master planning studies must identify the likely paths of student bicycle access onto the school campus, and the location of student bicycle stores (at least one P-6 schools, and at least two for P-10 schools) must be coordinated with those access routes.

The detailed design and siting requirements for bicycle storage is described in the Output Specification Volume 2 Part B – Architecture and Master planning.

Separate secure staff bicycle storage areas are required.

**Car Parking**

Car parking spaces are provided for Staff, visitors and Preschool parents.

See Volume 2 Part B Architectural and Master planning Specification for ACT requirements.



# ACT Education Directorate

## OUTPUT SPECIFICATION

*Sustainable Delivery of Public School Facilities Project*

*Volume 2 Part B –*

*Masterplanning and Architectural Specification*

*Project No 26243*

Version No.	Issue Date	Details	Author	Approved By
1.0				

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Volume	Description
<b>Volume 1</b>	<b>Project Overview &amp; General Requirements</b>
	Part A – General Information & Instructions to Proponents
	Part A – Appendices
	Part B – Proposal Requirements
	Part B – Appendices
<b>Volume 2</b>	<b>Output Specification</b>
	Part A – Functional Brief
	Part B – Masterplanning and Architectural Specification
	Part C – Technical Specification
	Part D – Loose Furniture, Fittings and Equipment Specification
	Part E – Schedule of Project Specific Information
	Appendices Indicative FFE schedule
<b>Volume 3</b>	<b>Draft Contractual Documents</b>
	Project Agreement, Schedules and Annexures
	Services Specifications

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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, but the public environment plays 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. Territory Plan – Urban Planning Principles

The 2009 Territory Plan Urban Principles Review developed six urban principles based on the Territory's Spatial Plan objectives. The six principles are:

1. **Liveability** – Create and maintain a diverse community.
2. **Economic Vitality** – Sustain employment opportunities.
3. **Accessibility** – Provide safe, convenient and attractive access to recreational, cultural, educational and employment destinations.
4. **Identity** – maintain a distinctive sense of place.
5. **Environmental Responsibility** – Protecting the natural environment.
6. **Accountability** – Ensure ownership of sustainability measures through good practice governance.

The Contractor must consider these principles, and develop a Master Plan for the School that implements them in the design response – with emphasis on principles 3, 4 and 5.

## 2. Masterplanning

### 2.1. Urban context analysis

A necessary precursor to a strongly grounded urban design proposition, within which to situate a school masterplan, is a rigorous, in-depth analysis of the Site and its embedding urban fabric. The masterplan 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;
- 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; and
- the Site topography, historical land use (considering ground condition and contamination risks), hard and soft landscape and ecology.

Information on the Site is located in the Schedule of Project Specific Requirements. This information might 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 masterplanning 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 influences and heritage overlays

The Schedule of Project Specific Information will identify any known site specific indigenous cultural overlay or heritage significance of the Site, or any requirement for a culturally specific design response. Schedule of Project Specific Information will include details of any requirement on the Contractor to engage, communicate, and work with the ACT Aboriginal and/or Torres Strait Islander communities in relation to this project.

Where such engagement is required, the Contractor must demonstrate an understanding of the Principles of engagement, and demonstrate 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.

If any indigenous archaeological site is uncovered during the course of the works, the Contractor must immediately cease work in that location and inform the Principal’s Contract Administrator.

### 2.3. Allowing for enrolment growth and flexibility

The ACT Education Directorate (the Directorate) uses relocatable buildings at some schools as an adjunct to permanent facilities, so that those schools can accommodate peak numbers of students.

Information on the Long Term Enrolment (LTE) and projected Peak Student Enrolment (PSE) for the School is detailed in the Schedule of Project Specific Requirements. That Schedule also contains the Territory’s further briefing on any forecast requirement for relocatable buildings that must be masterplanned for this School.

The masterplan must consider planning for Peak Enrolment and in particular it must propose practical strategies for the positioning of relocatable buildings, for alignment with the local educational context, landscape elements (hard and soft), service connections, and for integration with community use facilities.

#### 2.3.1. Masterplanning for modular and transportable buildings

If the Territory identifies that installation of modular and transportable buildings are required or can be expected at the School, masterplanning for the Site must:

- Include the design, construction and installation of modular buildings (to the quantity and configuration described in the Schedule of Project Specific Information); and

- allow planned space for the future installation of relocatable buildings in a manner which does not detract from the design and functionality of the overall Site or the permanent Facilities.

Modular buildings will be prefabricated modular structures, procured by the Contractor to a custom design (or designs) developed as part of this project, and delivering school functions in accommodation equivalent to the permanent facilities (refer Functional Brief Sections 5 - 7), but in semi-permanent structures that will be installed as part of the project, and which can be dismantled, moved or removed at a later date.

The functions accommodated in modular buildings may include:

- Learning Communities;
- Administration and Staff offices (including staff amenities);
- Library / Learning resource centre; and/ or
- Specialist learning spaces (Science, Technology, Engineering and Maths / Environmental Science / Learning Kitchen / Dance / Music etc).

These modular buildings must comply with the Building Code of Australia (BCA) requirements for educational buildings and deliver the same space quality, amenity, energy performance and access to services and toilets as are provided in the permanent buildings. The Contractor's custom design must consider shading of windows, cross flow ventilation, high performance insulation and the integration of shaded or roofed external activity areas at building floor level. The Contractor's custom design must also consider the selection of building forms, elevational treatment and the coordination of material selections with those used in permanent buildings – so that there is an aesthetic integration of modular buildings with adjacent permanent buildings. The energy consumption and efficiency of modular buildings will be included in the whole of school energy calculations. The design must demonstrate that the modular buildings deliver significant recycling and re-usability of the elements across the life of the building (which must be not less than 25 years). The design must demonstrate that the buildings can be simply disassembled and relocated to another site for continued use, with minimum material wastage and minimum make good work at the new location.

Transportable buildings may be brought on to site progressively at a later date to provide accommodation for peak student enrolment and may stay on site for a 5 – 10 year period. These will be conventional modular transportable buildings, rectangular, to manufacturer's standard design for doors, windows, roof line, etc., and with open planned internal space. The interior spaces of transportable buildings may be adapted to serve different functions including general Learning Community, administration, library, art, etc. The design must demonstrate that the buildings can be simply and safely moved onto and off the site with minimum disruption to school activities and external environments.

Modular buildings and transportable buildings must have the equivalent standard of accessibility, and provision of services (water, drainage, power, lighting, data, electronic security, evacuation/ lock-down alarm, heating and cooling, etc.) to that provided in permanent buildings.

Modular and transportable buildings may be on the School site for potentially extended periods of time, and deserve the same status as permanent Learning and Teaching areas. They should read as an integrated part of the School, connected to the open space and circulation networks. Landscape can be used to integrate modular and transportable buildings and give status to 'temporary' parts of the School. Differentiation can also be achieved through clever use of materials, colour and Site planning.

As part of the inclusion of modular and transportable buildings into the masterplan design, the Contractor must:

- consider constraints and opportunities presented by the site, the proposed placement of permanent buildings, pathways, play areas, civil works, underground services, etc., and the constraints presented by existing and proposed contours and site topography;
- consider how the modular and transportable buildings can be clustered and distributed to enable similar learning environments to those provided in permanent Learning and Teaching areas (and noting that preschool transportable building(s) must be located near the preschool so that they open onto the preschool outdoor play space);
- consider the placement of modular and transportable buildings to avoid negative visual and aesthetic impact on the street and public realm;
- consider and allow access and logistic space for the planned safe delivery, placement and subsequent removal of those buildings - allowing for the size of transport vehicles and lifting equipment used for this purpose and providing unobstructed routes of delivery access across the Site, noting that transport vehicles cannot travel

over soft ground or deep swales or beneath tree canopies, or negotiate ground with excessive slope and camber); and

- design the positioning of modular and transportable buildings to integrate with the site contours, site services, permanent buildings and structures, overflow carparks, play areas, pathways, outdoor learning areas, parent drop off areas, shared facilities, emergency services and utilities including water, power and communication technology.

Masterplanning of the site must consider and present (for the Territory’s review) alternative approaches for the future placement of forecast transportable buildings in the context of the proposed arrangement of School facilities and external spaces. Options to be explored include:

- Transportable buildings generally distributed around the site to provide additional capacity proximate to the age-specific learning environments (from Pre-School onwards);
- Transportable buildings arranged as one or more Learning Community clusters, accommodating up to 150 students connected back to the permanent buildings using pavements and covered ways;
- The proposed placement of transportable buildings that deliver specialist activities (e.g.: science, administration – if required) in locations that relate to the same functions in the permanent buildings; and
- Engineering services (electricity, communications, gas, water, sewer and stormwater) shall be reticulated to the proposed location of future Relocatable Buildings and terminated in secured ground pits or capped branch inlets, as appropriate, to facilitate future connection of new buildings.

## 2.4. Future development

Where relevant (and where identified in the Schedule of Project Specific Information), the master plan must provide for the opportunity to deliver future school or community infrastructure. These considerations will inform the design of outdoor spaces between buildings and the linkages and opportunities beyond the Facilities.

## 2.5. Integration of Early Education and Care Centres and community facilities

The Master Plan for the 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 those other facilities and their community of users. The shared use of car parks should also be considered.

### 2.5.1. Community use of school facilities

All opportunities to design facilities with reference to the broader community context and to 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 that the school has a role as a community resource.

The configuration of Facilities must support opportunities for use outside school hours by the small and large groups of users drawn from the school and the wider community. Spaces and functions suited to community use must be designed to be available for parents and community members to gather and meet, learn, be active and be involved. These spaces may include sports facilities, performance and presentation spaces, the library/learning resource centre, spaces to accommodate out-of-school-hours care programs, community gardens (where provided) and spaces suited for small and medium sized community meetings and social activities. The School may be used as a voting place, and may be used as an emergency evacuation centre.

The design must show that these spaces (and the necessary amenities and services) can be zoned and isolated for contained use out of hours. Provision must be made to secure the limits of suitable community access areas, so that unauthorised persons are prevented from accessing the remaining areas of the school. When a limited area is secured for community use, it must deliver all user requirements including zoned and sub-metered building services, zoned isolation of security services, emergency egress and access to amenities.

Consideration must be given to direct external access to community use zones, the approach path and safe departure route for users who may be moving across the school grounds at night or at weekends.

## 2.6. 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.

## 2.7. Movement networks

Masterplanning, particularly the location of entry points and car parks, should have reference to the surrounding footpaths, pedestrian crossings, bicycle paths, bus bays, street network and its traffic management infrastructure.

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 masterplan 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 masterplan 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.

## 2.8. Summary of key considerations

The masterplanning 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;
- 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;
- a clear hierarchy of open space and a 'heart' for the school. The external area of a school must contain outdoor areas that vary in scale from larger gathering and play spaces, to medium play spaces to smaller, intimate areas of refuge and a flow between indoor and outdoor space where appropriate;
- 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 transportable buildings 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; and

- 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.

The Territory is committed to developing and delivering high quality, innovative, efficient 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 and durable, 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 at least 13 years (kindergarten to year 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; and
- The learning outcomes 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.

Therefore it is 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 them day-to-day, and which will also 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 evidence<sup>1</sup> 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 from each other and through their own self-directed activities are vital to 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:

- reflect the Territory's vision for learning and Education Facilities Design Principles as outlined in the Functional Brief – Sections 3.1, 3.4 and 4.1
- are fit for purpose;
- are safe and secure;
- reflect the design intent and functional requirements specified in the Functional Brief Section 7;
- are Site responsive to the setting, the urban structure and identity of a place;
- are environmentally, economically and socially sustainable (the triple bottom line);
- are engaging, diverse and inclusive;
- are culturally rich and poetic; and

<sup>1</sup> 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>

- 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 but 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 School will belong to a unique place and community, as described in the Schedule of Project Specific Information. 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 pride among those involved in the activities accommodated in the Facilities;
- deliver School environments where students want to be; where they are inspired to create and learn;
- incorporate external leaning 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 the Functional Brief - Section 7 and Table 10) and are bright and stimulating or calm and relaxing as appropriate;
- provide spaces that are well-proportioned, and efficient in circulation. Circulation that is efficient has a clear hierarchy and can, where appropriate, be programmable to also accommodate other uses such as display, breakout areas or lockers;
- ensure the layout enhances the operational efficiency of the school activities and the orientation of each school building must take full advantage of the opportunities offered by the Site. The architectural design must consider how this can be best achieved through the use of massing, form, materials 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; and
- optimise the integration of Ecologically Sustainable Design (ESD) principles.

The following overarching Architectural Design Principles apply:

Architectural Design Principles	
Site plan	Making the best use of the Site's natural and physical features, views, orientation, edges, existing flora and fauna, pedestrian and vehicle access.
Masterplan	Creating a clear hierarchy for the buildings and spaces between, street presentation, lines of sight for staff supervision of students during breaks, capturing opportunities beyond the Site boundary and planning for good integration of mobile and relocatable buildings, anticipating change in the development of the site, and making provision for the staging of works.
Functionality	Demonstrating an understanding of the functional requirements and functional relationships described in the Functional Brief, and resolving those requirements and relationships – diagrammatically in abstract – as the basis for the further development of planning for buildings and the Site.
Buildings	Making form, scale, mass, volume, appearance and sustainable design

<b>Architectural Design Principles</b>	
	principles work together.
Identity and context	Designing Facilities and the landscape of which the students, educators, parents and community can be proud and which also enhance neighbourhood amenity and urban structure.
Universal design	Designing an inclusive built environment through universal design principles (design for all) to enhance social inclusion and equality.
Pedagogy	Engaging the school community, educators and students in the design process. Developing the 'next generation' of designs that enable 21 <sup>st</sup> century learning and teaching while being adaptable to a school's specific philosophy and needs of the learners and teachers.
Quality of the learning environment	The Facilities must deliver and sustain physical environments and user comfort conditions that are conducive to learning, including the layout of spaces, materials selections, indoor air quality, daylight provision and control, thermal comfort, and acoustic engineering amongst others. The Contractor must demonstrate an understanding of the relationship between learning outcomes and the design and operation of School facilities, and seek to maximise (through innovative design) the potential for improved learning outcomes, the quality of space and the user's experience of it.
Inspiring spaces	Beyond function, architecture should excite the imagination and create spaces that are engaging, diverse and inclusive; culturally rich and poetic, enjoyable and a great place to be.
Landscape and external environments	Making all external spaces assets for formal and informal learning, enhance social interaction and play, good supervision of students by a minimum number of teachers, diverse in use and function, age-appropriate, and utilising sustainable principles to support flora and fauna, biodiversity and improve water quality. Trees (existing and new) are to be used to support each building's passive heating and cooling system as well as for sun protection for students when outdoors. The Landscape development strategy must allow for larger trees to be established early followed by engagement from the school community.
Supporting Community use	Facilities that support and encourage community use through the identification of spaces suited to community and out-of-hours use, zoning of community use spaces in the design (including zoned and sub-metered engineering services, security controls and access to amenities), ease of direct safe access (out of school hours), provision of storage, etc.
Interiors	Creating excellent spaces for learning and teaching and using interior design to create a positive environment for students of all learning needs. The design is to demonstrate a co-ordinated selection of colours, finishes and materials.
Feeling safe	Creating a secure and welcoming place.
Long life, loose fit, low energy	Designing for whole-of-life, creating Facilities that can adapt and evolve in the future, which integrate community use and are adaptable in structure and plan.
Ecological sustainability	Designing for environmental, social and economic sustainability, efficient lifecycle, reduced maintenance cost and reduced resource usage and

Architectural Design Principles	
	support of recycling.
Successful whole	<p>Facilities that integrate buildings, landscape, infrastructure, sustainability and the Site; cohesive in architectural form and expression and considers all interstitial spaces.</p> <p>The school facility 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.</p>

### 3.1. Innovation

It is an objective of this Project and this Specification that the Contractor delivers innovative design of learning and teaching spaces - placing a strong emphasis on learning and learner-centric design, as opposed to teaching and teacher-centric design - to maximise the potential of available area to enhance the learning of students and teachers.

In support of innovation the different ways to achieve functional requirements and philosophies must be considered. Alternative design strategies will be fully considered against all design criteria.

The design of new inspiring schools will require an ability to adapt to educational and technological change. ICT can give schools the option of teaching children as individuals, in small groups and in large groups, and offer electronic links to other schools and facilities locally, nationally and globally. The inevitable evolution of ICT will require future-proofed spaces and reconfigurability in design.

### 3.2. Universal Design

Universal design recognizes that there is a wide spectrum of human abilities, including physical, perceptual, social and cognitive abilities as well as there being different ages, 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 Functional Brief Section 4.1.2.

#### 3.2.1. Inclusion

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 each of the Learning Communities, 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

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.

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).

Spaces that might come under pressure for expansion (if a School significantly exceeds its LTE) are the Staff Lounge, the General Office, the Learning Resource Centre, and the General Purpose Hall.

### 3.5. Ecologically Sustainable Design

The Contractor must incorporate ESD principles into the design, construction and operation of the Facilities in ways that:

- deliver Facilities that remain environmentally and ecologically sustainable through the Operating Phase;
- are relevant to school operations and patterns of use;
- provide learning opportunities related to the environment and sustainable futures; and
- will enhance the quality of the internal amenity.

ESD elements must be integrated into design solutions, providing multiple benefits and working in harmony with the overall design.

Three primary benefits must be realised from investment in ESD strategies in design and building performance:

- whole of life performance for the Facilities;
- quality of the learning environment; and
- breadth of the learning experience.

#### 3.5.1. Whole of life performance for the facilities

The whole of life performance of the Facilities must be considered in terms of economic, social and environmental impacts and opportunities.

Life cycle costing is to be used to guide design and procurement decisions to optimise the balance between capital and operating costs to ensure whole of life best value for money outcomes.

The environmental impact of the design, and up-stream and down-stream impacts of material selections, energy consumption etc. must be considered. ESD is to be integrated within the School as a whole, including planning and spatial organisation, materials selection, building services, landscape systems and planning, pedestrian and bicycle-friendly links to the surrounding streets.

Buildings and urban open spaces must be designed in such a way that a minimum of energy is needed to light and service them in terms of hot water, heating, cooling, ventilation and the generation of electricity.

The use of passive energy measures to achieve a comfortable internal environment must be employed where possible. The form of each building must be developed to take account of the need to minimise energy consumption with particular emphasis on maximising the use of insulating materials, natural ventilation and day-light, and passive solar design to maintain comfort conditions.

The sanitary fittings installed and the landscape is designed in such a way that a minimum of water is needed for human use and irrigation. Rainwater runoff from all roofs is to be captured in tanks for use in toilets and irrigation.

The Facilities must be designed with the future in mind, and the Contractor must take a risk-based approach to foreseeable risks such as climate change.

#### 3.5.2. Breadth of the learning experience

Because of their presence in all communities, schools have the potential to be flagships for change in sustainable sensitivities and to act as demonstrators of practical sustainable approaches and technologies.

The operation and monitoring of ESD systems can form part of the learning process, by giving students opportunities for personal responsibility in the management of ESD active systems and by providing them with the data on seasonal energy and resource consumption that can inform an understanding of the sustainability footprint of their school, their community and their family. In this way, the adults of tomorrow can grow up with an understanding and appreciation of the sustainable living patterns that the world needs, and with an understanding that individuals need to take personal responsibility for creating a sustainable future.

Many ESD initiatives could have features added (education enablers), which are not required to deliver the ESD outcomes, but that enable the initiative to support curriculum requirements and desired learning outcomes. For example, a photo voltaic system could deliver the ESD outcome of reducing consumption of fossil fuel sourced power. Putting the system in a visible location so students can see it, and providing a display that shows how much electricity

has been generated, would be education enablers. Identifying and implementing education enablers is the required approach. ESD features must be incorporated in a manner that encourages practical student interaction and reinforces student's understanding and appreciation of environmental issues.

### 3.5.3. 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 fixed and operable shading of east-facing, west-facing and north-facing windows;
- insulation of roof (both reflective and bulk insulation), walls and 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);
- night purging of the buildings;
- 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;
- draught 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. If possible, heated areas must be separated from the outside by airlocks; and
- doors must be located, if possible, on the eastern side of the building to avoid cold southerly winds (as well as hot northerly winds).

## 3.6. Internal learning spaces

All learning spaces must be designed to inspire students and promote learning as an activity.

The Functional Brief sets out the Education Design Principles (Functional Brief: Section 4) to be implemented in the design of learning spaces.

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. It must offer the range and relationship of learning spaces, settings and functional elements specified in the Functional Brief - Section 7 and Table 10.

### 3.6.2. Circulation vs terminal spaces

Circulation spaces (also known as travel) 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.

### 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. Natural ventilation

The ventilation design must consider seasonal variations in climate conditions, orientation of the buildings, and wind direction to maximise natural air flow whilst limiting the entry of dust, pollen and other allergens.

### 3.6.6. 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; and
- 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 and the Indicative FF&E Schedule for each Functional Area. The Contractor’s architectural team must be involved in the selection of furniture to ensure fit out achieves the team’s design intent for each functional area and setting. Functional Brief – Section 7 and Table 10 must be used as references.

## 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. School environments include not only social, cultural and physical aspects, but also natural, built and virtual environments.

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 ‘nooks and crannies’ 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;
- 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 hiding spots (shrubs, substations, etc.);
- provide safe access to toilets at all times; and
- provide security lighting to building perimeters, car park and external paths of access.

### 3.9. Storage

Schools make frequent use of teaching aids and resources, creative media, creative play materials, games, special furniture and equipment, etc. to support teaching and learning activities. Resources will be in various forms and quantities – some suited to storage on adjustable shelving, and some requiring floor space. The design must consider the distribution of accessible, well designed and efficient storage through all Teaching and Learning areas, so that these resources can be available where needed, when needed and can be securely stored away when not in use.

Storage must be provided near to external learning environments, to facilitate the transfer of learning resources, and to provide space for the storage of loose Furniture, Fittings and Equipment FF&E that will be used to activate those outdoor areas.

Storage must be provided for use by Community groups - associated with community use spaces, including out-of-school hours care, sports groups, etc.

### 3.10. Signage and Wayfinding

#### 3.10.1. Wayfinding design principles

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; and
- 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-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; and
- emergency access.

### 4.3. Emergency exits

All emergency exits must be BCA 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 access

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 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. 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 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. Some vehicle journeys will be short stay – such as parent drop off or collection of students; student arrivals and departures by bus, goods deliveries; and visitors arriving for interviews or meetings. Some staff vehicles will stay for a full day. Visitors out of normal school

hours may stay for several hours to watch or participate in a performance, function, or sports event. The school may have a bus that is parked permanently at the site. Emergency vehicles may rarely attend the site, but have high priority for direct unimpeded access to specific locations.

Commercial vehicle movements will include known and scheduled events (e.g.: a waste truck arrives regularly, at a scheduled time and follows a short, defined, and known path of travel), or frequent but irregular arrivals, in large and small delivery vehicles, needing 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 canteens, or to STEM/ Art 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, but this has consequences in terms of space devoted to vehicle access, and 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; and
- 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 point of vehicle entry. 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 Masterplan 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 masterplan 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 parking and motorcycle parking with kerb and channel, line marking and pram crossings.

Provision of on-site parking for staff and visitors, and short-term set-down/pick-up vehicle spaces must comply with the requirements of the ACT Parking and Vehicular Access General Code (schedule 6) for the defined Long Term Enrolment of the School. Appropriate parking must also be provided for community use of Community Facilities in accordance with the requirements of the Code.

Car parking must be constructed with appropriate paving, kerbs and marking and located so as to be readily accessible to the main school entry and administration areas and separate from student play and circulation areas. Within the car park area, provision must be made for disabled parking in the staff areas, with easy, unhindered access to the front entrance of the School.

Car park layouts are to be designed to the requirements of all relevant Quality Standards and Laws. Unless agreed otherwise, parking bay width and length must be designed for User Class 2 as listed under AS2890.1 with the minimum dimensions of 2.7m wide × 5.4m long with a 5.8m access aisle. Each disabled parking bay must be designed in accordance with the minimum dimensions as contained in the AS 2890.6.

The location of staff and visitor car parks must include and allow for:

- convenient access for staff from car park to buildings;
- convenient access for visitors to the School reception;
- designated and signposted disabled car parking bays; and
- access to School facilities that may be used by the community outside of school hours.

The design of the Facilities must reflect careful consideration in laying out pedestrian and vehicular access and movement routes. All traffic control measures must be clearly signed so that visitors are in no doubt as to how they must proceed and where they should go. If pedestrians and vehicles have to share the same pavement, the pedestrian routes must be clearly marked and provided with sufficient separation from motor vehicles.

Delivery vehicle access may be incorporated into a staff car park in order to have close access to areas such as administration, canteen and technology.

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. Provision of bus parking**

Provide access roads and secure covered parking on site for at least one 20 seater school bus. The bus shelter must be co-located with similar shed buildings (e.g. the sheds for the productive garden and the community garden).

The sheltered bus parking must be, as a minimum, a steel framed structure with colorbond profiled steel roofing, with a concrete floor slab suitable for the weight of a bus, and with security lighting to the soffit of the roof.

#### **4.8. Waste storage and disposal**

A screened and contained 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.

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, enhance pride, and provide an extension of the indoor learning environment.

Interaction with nature is vitally important in children’s physical and mental development, and integrated outdoor educational areas can significantly enhance learning opportunities. Play as pedagogy is important as it develops the child’s social, physical and cognitive skills. In primary schools it is important that a variety of spaces and activities encourage creative and open ended play. While fixed modular equipment has its place, moveable elements and loose materials are more effective in encouraging creative play. It is important that there is sufficient space for age/stage appropriate play areas, for break out space when required and that external play areas are supported by teacher supervision, adequate seating, equipment, shade and materials.

Students learn best when they are immersed in their immediate environment and are using all five senses. The careful design of outdoor learning spaces can instil an appreciation of the natural environment and bring about sensory, health and aesthetic benefits.

Well-designed external environments can improve the functionality, durability and flexibility of open spaces, the thermal performance of buildings, and offer shade and shelter in playgrounds.

The design of external environments must:

- integrate the expertise of an education designer and planner in the masterplanning process from the outset to ensure that outdoor spaces are activated and designed to enable learning as described in the Functional Brief for External Learning Settings (Functional Brief – Section 7.5.2);
- integrate the expertise of a landscape architect in the masterplanning process from the outset so the key opportunities and assets of the Site are captured;
- establish a hierarchy of open space to provide functional, adaptable, expandable and durable landscapes to support positive learning environments;
- conserve and respect the natural vegetation, topography, ecology and heritage of the Site;
- support and express different cultural perspectives in the external environments;
- consider the main entry points, nodes, linkages and gateways for students and the local community;
- develop the spaces between buildings to foster various modes of recreation, gathering and socializing;
- integrate seating areas and nooks within the building perimeter to form outdoor gathering areas;
- consider how deck and ramp areas can also incorporate in built furniture and other opportunities for play;
- consider the interface between built form and landscape and how the building form can define/imply outdoor gathering areas;
- have a consistent design intent between the architecture and the landscape;
- demonstrate sustainable land management practices and landscape design that reflects the indigenous history of an area;
- provide robust, durable, high-quality external furniture in configurations that can support outdoor learning, student socialising and offer an integrated design solution;
- integrate interpretive and educational opportunities within the landscape to facilitate active and passive outdoor learning;
- consider the requirement for ongoing maintenance of outdoor areas and minimize seasonal impacts;
- prevent soil erosion;
- define the functional role of each outdoor space. This will influence the size, level of enclosure and relationship of outdoor spaces with internal spaces;
- establish a clear planting structure. Ensure that the main structure planting is introduced as early as possible to provide identity, enclosure and shade to outdoor spaces;
- consider the specific needs of the different school type and student cohorts;

- 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;
- deliver ‘spatial experiences’ within the external environments. The Functional brief requires internal and learning environments to support multiple teaching and learning modes. Similar thinking as is applied to the design of internal spaces and settings, should be brought to the design and activation of external environments;
- consider the visual outlook from internal learning environments. Where possible enable visual access to nature and exploit existing features such as mature trees; and
- spaces must be socially inclusive. Consider how spaces are used and appropriated by different age groups and students with special needs and what elements are required to activate these spaces.

## 5.1. Biodiversity

The design of external environments must incorporate the following strategies for maintenance of biodiversity, and for improvement of the natural environment:

- Use of native and endemic plant species where possible within school grounds to support biodiversity and in particular local fauna.
- The site masterplan and the landscape design are to incorporate biodiversity considerations, as follows:
  - Retaining existing native and endemic tree and understorey plant species (where possible);
  - New plantings to be predominantly endemic and native. The plant palette is to be based on the nearest natural bushland areas to provide connectivity and increase the likelihood of migration of flora and fauna;
  - New plantings to contain a variety of species and avoid monocultures;
  - Where feasible new trees and plant specimens to be sourced from areas within the same climatic zone;
  - Native and exotic food production gardens;
  - Composting and worm farming (see also Operational Waste requirements);
  - Drought tolerant planting species suited to the local climate to be used to reduce irrigation requirements;
  - Where feasible biodegradable mulches to be used to improve micro bacterial activity and reduce irrigation requirements;
  - Plantings and landscape features to slow surface water movement and increase stormwater infiltration, filter pollutants and provide habitat, such as retarding basins, detention in dry basins, swales and bioswales; and
  - Deciduous and evergreen trees to be planted to provide shade to building walls and external areas appropriate to the seasons and climate changes.

## 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 and the use of thermal mass in ground and wall surfaces.

### 5.2.2. Civic presence

The landscape design should complement the masterplan to enhance the civic presence of the school whilst maintaining the ‘bush’ character that is characteristic 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 to inform its masterplanning 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* which will drop branches) and implement an appropriate management strategy and fence off the hazard area. During construction 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.

#### **5.2.5. Covered ways**

Where Facilities comprise two or more buildings and where Facilities include the provision of transportable buildings as part of the initial development, covered ways 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.

#### **5.2.6. Bicycle parking**

Bicycle parking and sheltered storage must be provided on site for staff bicycles and for student bicycles/ scooter in accordance with the ACTPLA Bicycle Parking General Code (October 2013).

### **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 Technical Specification for technical requirements of built shade and natural shade provision).

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 special needs students, that those areas are also provided with suitable playground shade.



# ACT Education Directorate

## OUTPUT SPECIFICATION

*Sustainable Delivery of Public School Facilities Project*

***Volume 2 Part C – Technical Specification***

***Project No 26243***

Version No.	Issue Date	Details	Author	Approved By
1.0				

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	Part A – Appendices
	Part B – Proposal Requirements
	Part B – Appendices
<b>Volume 2</b>	<b>Output Specification</b>
	Part A – Functional Brief
	Part B – Masterplanning and Architectural Specification
	Part C – Technical Specification
	Part D – Loose Furniture, Fittings and Equipment Specification
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## 1. General

### 1.1. Introduction

A detailed overview of the Project, and its requirements, is provided in Volume 1 of the Request for Proposal (RFP) and should be referred to as needed to provide context and background to the various parts of this volume, Volume 2.

Part C of the Output Specification is intended to provide the principles for the design and construction of the building services, utilities, ESD, structural, civil, acoustic, security, building fabric and finishes, ICT and communication components for the Project.

All references to sections and tables in this Volume 2 Part C are references to sections and tables in this Volume 2 Part C unless expressly stated to the contrary.

The Development Phase Activities must be carried out in accordance with Best D&C Practices with emphasis on energy efficiency, ESD principles, adaptability, reliability, durability, safety, and allowance for future expansion and reconfiguration.

The Design Deliverables must 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; and
- installed and commissioned in accordance with all relevant regulations and Australian Standards.

The engineering services must complement the delivery of the Education Services.

### 1.2. Structure of Volume 2: Output Specification

The Output Specification is structured as shown in Table 1.

**Table 1: Output Specification structure**

Part	Heading	Contents
A	Functional Brief	Outlines the Education Vision, Values and Priorities and key education principles of the Education Directorate (the Directorate) and their implications for facilities design. Broad functional requirements, functional relationships and specific functional requirements are described for the particular school type: Preschool – Year 6.
B	Masterplanning and Architectural Specification	Details the masterplanning requirements and architectural design principles. Provides details of the minimum requirements for landscape and traffic design.
C	Technical Specification	Details the minimum performance standards for each element of the building services, utilities, ESD, structural, civil, acoustic, security, building fabric and finishes, ICT and communication requirements, and landscape and external works that the Contractor must provide in the design and construction of the School.
D	Loose Furniture,	Details the loose furniture, fittings and equipment

Part	Heading	Contents
	Fittings and Equipment Specification	requirements for the Project.

### 1.3. Design life expectancies

In accordance with Best D&C Practices, the minimum design service life of all construction work, systems and equipment from the Operational Commencement Date of the School must be in accordance with the design life expectancies as contained in Table 2 below.

**Table 2: 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
<b>Engineering plant</b>	
Packaged air-conditioning plant	15 years
Boilers	20 years
Pumps	20 years
Dampers	20 years
Fans:	
Centrifugal backward curved	30 years
Axial	20 years
Propeller	15 years
Roof mounted	20 years
Reciprocating engines	20 years
Lighting	15 years
Sub-mains	20 years
Outlets	10 years
Data racks	10 years
PA system	10 years
Switchboards	30 years
Photovoltaic panels	25 years

System or item of equipment or element	Minimum design service life
Inverters	20 years
<b>Engineering services distribution systems</b>	
Ductwork	30 years
Valves	30 years
Valve actuators	15 years
Reciprocating engines	20 years
<b>Civil works / other</b>	
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

#### 1.4. Design criteria

The Contractor must comply with all relevant regulations and Australian Standards. In addition the Contractor must comply with and satisfy the following minimum requirements:

- all Territory and Municipal Services Directorate requirements and supply Authority requirements; and
- 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 must allow for the user behaviours and use demands that can be expected for the School.

#### 1.5. Peak Enrolment and spare capacity

The Contractor must ensure that the Utilities and infrastructure provided meet the requirements and service demand of Peak Enrolment numbers for the School and any specified or forecast community or third party use. The Contractor must also allow for spare capacity requirements (where specified) that are in addition to the provision needed for Peak Enrolment capacity.

#### 1.6. Flexibility and adaptability of building structure

The building structure must allow flexibility for internal space planning and possible later re-configuration of building interiors. The building structure must allow for the reticulation of services throughout the School, and must provide support for all identified current or foreseeable future needs.

#### 1.7. Flexibility and adaptability of building services

The services in the School may be subject to an ongoing program of alteration and/or modernisation to suit teaching and technological changes over the life of the School.

As such, the engineering services must be designed to be flexible and readily adaptable. Such design must allow change with minimal disruption to the operation of the School and at a minimum cost.

In addition to the general School use of services, the services will supply multiple users including a range of community use during and outside of normal school hours. The School must be designed and constructed with appropriate zoning and sub-metering of services to allow for economical activation of services in community use areas, and to allow utility consumption to be simply metered and itemised and charges allocated to the relevant user.

The Contractor must incorporate the following features into the services systems design:

- sufficient isolation must be provided on all piped services to allow shutdown of individual part-floor or part-building zones for maintenance and upgrade works without requiring shutdown of whole floors or whole buildings or adjacent independently operational areas. For example, maintenance works in a toilet area must not require shutdown of services to an adjacent teaching space;
- services reticulation routes including service corridors and risers must be designed to allow direct access for future works to be carried out. Services must not be laid out such that any service has to be shut down and/or removed to access, work on or remove other services;
- service reticulation zones within ceiling spaces must be provided and must be accessible from removable tile ceiling areas or access panels 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 must not require access through teaching areas or administration offices during core hours. Services reticulation zones must be restricted to spaces over corridors and non-teaching areas, including cleaners' rooms, toilet areas and lobbies;
- 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;
- air conditioning air-handling plant shall be located at floor level with suitable maintenance access. It shall not be located in ceiling spaces
- services risers (where provided), services cupboards and plant rooms requiring regular maintenance access must be grouped into service zones on floors or within buildings. Services zones must be adjacent to floor access points such that the need for service technician intrusion into teaching and administration areas is minimised. Service risers must 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;
- ceiling spaces must be zoned vertically, particularly within services reticulation zones, to minimise clashes between services; and
- waste and exhaust air shall be discharged to the exterior of the building and not into ceiling spaces.

These vertical zones must include a zone at ceiling level for lighting. A zone above this must carry all cable trays. The zone immediately above this must carry reticulated piping and if required, ducted services. The structural zone above this must also carry any additional services.

**Note:** structural members must not intrude into the electrical or piping/ducting zones. Where piped services require a gradient these services may penetrate the ductwork, pipes services and cable tray zones but not the lighting zone.

## 1.8. Design guidelines for site services and building services

The Contractor must:

- give priority to the needs of School Users;
- ensure that Site connections to mains services (including above ground cages and enclosures around valves, meters and controls) are positioned well clear of the School's main pedestrian entrance;
- 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 building roofs; and
- ensure that the School's main pedestrian entrance and approach is free from service pit lids, access and inspection covers and other potential trip hazards.

## **1.9. Plant space and reticulation**

### **1.9.1. Plant space**

Engineering Plant and equipment installations must be arranged such that Plant and equipment that requires scheduled maintenance servicing is located outside of teaching or occupied accommodation areas.

The Contractor must locate Plant and equipment within dedicated services cupboards or plant rooms. Spatial allowances to cater for Peak Enrolment demand must be made in all plant rooms, services cupboards and risers.

Where riser shafts are used, all riser shafts must be fully accessible for the height of the riser. Plant and equipment requiring access in services cupboards must be limited to a maximum height of 2.2m above floor level. No Plant or equipment will be located such that access to or in riser shafts is impeded.

Plant and equipment must be located to avoid vibration and electromagnetic interference. Plant and equipment accommodation must also take into account the acoustic requirements of adjoining occupied areas.

Where duplicate services are employed, these services must be located in separate riser shafts and follow distinctly separate routes.

Access to equipment in plant rooms must be via normal walk-in access and must not require the use of specialised access equipment or temporary scaffolding. Permanent access platforms and ladders must be provided where safe maintenance access is not possible from floor level.

Plant and equipment access must take into account the access needs for the replacement of all major components. Access and removal routes must be planned.

Fresh air intakes (including openable windows) must be arranged to minimise the risk of air recirculation under prevailing wind conditions, or cross contamination from nearby exhaust vents and flues.

Schools are not occupied for large parts of each day, and are vacant for extended periods over holiday breaks. When placing expensive services equipment outside, the Contractor must make all necessary provision for security and protection against theft and vandalism.

### **1.9.2. Services reticulation**

Service routes must be designed such that clearly identified routes are provided for piping and cabling installations from central plant to final usage points.

Zoned ceiling spaces for the reticulation of services with appropriate access must be provided. All services must be segregated to suit the function and type of service.

Cables must be segregated into high voltage, low voltage, communications, fire services and security services.

All services must be fully supported along their length. No service will be supported by an accessible or lightweight ceiling structure.

## **1.10. Redundancy, capacity and spatial provision for future expansion**

The Territory has identified the Long Term Enrolment and the anticipated Peak Enrolment for the School.

The Contractor must provide sufficient spare space and spare capacity to accommodate for the Peak Enrolment.

All services reticulation routes, from those running to central Plant and equipment locations to those routes through corridor ceilings must be provided with a spatial allowance for distribution of future services.

The Contractor must provide the following requirements with regard to spatial provision and engineering services design to accommodate for future expansion:

- the capacity of all incoming and outgoing services to the Site must accommodate Peak Enrolment student numbers;
- reticulation of installed Site services and infrastructure must make provision for Peak Enrolment including distribution of local power and security conduits and connector pillars, distribution of ICT conduits, distribution of water supply and drainage connection points to a location maximum 40m away from the proposed location of Transportable Classrooms;
- all vertical and horizontal distribution including piping, racks, trays, culverts and service corridors must have allowance for future expansion;
- all switchboards and panels must incorporate spare capacity and spatial allowance for expansion;
- all services risers must be accessible for their full height and must have space for future services;
- all services cupboards for switchboards and panels must have space for future services;
- all central Plant and equipment, including boilers, electrical sub-stations, etc. must have a spare capacity for future growth built into their sizing calculations; and
- the design strategies employed to ensure adequate flexibility and adaptability must include intelligent spatial planning, good access to all services, provision for Plant redundancy and replacement, and the provision of adequate means of isolating systems and parts of systems to carry out future works.

### 1.11. Quality of materials and equipment

Materials and equipment used throughout the Project must be new, of good quality, free of defects, fit for purpose and in general conformity with the 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 during manufacture, use or disposal;
- do not cause unnecessary waste, either because of over-packaging or because of an unduly short life-span; and
- 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;
- Cost and frequency of maintenance and replacement parts;
- Ease of maintenance and upkeep;
- Durability;
- 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; and
- 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.

### 1.11.1. Consistency

Where a product is repeatedly required in multiple locations, the Contractor must consistently use the same product in each location.

### 1.11.2. Second hand materials

Where the Contractor proposes to use second hand or recycled materials, such use will be subject to consideration by the Territory and the Territory reserves the right to reject or not reject any proposed use of second hand materials at its absolute discretion, based on an assessment of the offer and the materials. If accepted, second hand materials must 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.

## 1.12. External exposure

Where long term exposure to sunlight and ultra-violet rays presents a risk of degradation of external equipment, services or materials, provide protection in the form of shelters, covers, conduits, shields and the like.

## 1.13. Operating and Maintenance Manuals

A complete and comprehensive facilities manual is required in paper and electronic format. This is to include at least the following items:

- reduced copies of accurate as-constructed drawings, including for all buildings works, all site works and all engineering services;
- operation and maintenance manuals for all machinery and equipment provided whether fixed or mobile;
- user guide for maintaining thermal comfort conditions in building interiors, including guidance on operating blinds, ventilation, heating and cooling;
- details of relevant contact persons for maintenance requirements;
- schedule of equipment installed, including make, model, location, serial number and warranty details;
- maintenance regime requirements/spare parts/special tools;
- 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; and
  - major equipment maintenance schedules/servicing access clearance requirements; and
- operating and maintenance manuals are to be fully indexed and tabulated and must be internally quality tested and approved by the Contractor prior to forwarding to the ACT Project Manager for approval prior to issue of a Certificate of Practical Completion.

The Contractor must provide to the ACT Project Manager before Practical Completion the operation and maintenance manuals covering, without limitation:

- architectural;

- civil;
- structural;
- landscape – softscape;
- landscape – hardscape;
- traffic;
- signage;
- hydraulic services;
- mechanical services;
- electrical services;
- essential services maintenance requirements;
- lighting;
- communications;
- security alarm system;
- access control system;
- 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 must 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 WUC which will require a change in operating or maintenance procedures first enters service, whichever is the earlier.

#### **1.14. User training**

The Contractor is to develop and provide training sessions that explain how users are to operate the facilities, use and operate individual engineering systems, 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 is to be structured, targeted to the requirements of the training cohort, supported by notes, charts, presentations, delivered in a suitable training environment and will include – where appropriate, practical demonstrations.

Training sessions and training content are to be recorded on video, and the Contractor shall provide the Directorate with a record set of training manuals and notes, including PowerPoint presentation, all material presented electronically and training videos of any demonstrations (CD & DVD);

## 2. Legislative Requirements

### 2.1. Compliance

The Contractor's activities and the works delivered by the Contractor must comply with:

- All Acts, Ordinances, regulations, by-laws, orders, awards and proclamations of the Commonwealth and the ACT;
- the most current version of the Building Code of Australia (Volumes One and Two of the National Construction Code (NCC) and Volume One – Appendices Variations and Additions);
- 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 ACTION 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); and
- the National Code of Practice for the Construction Industry.

### 2.2. Development Approval

The Contractor is responsible for

- 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; and
- compliance with the procedures and requirements of the relevant Territory Authorities and Agencies (including ACT Planning and Land Authority (ACTPLA), TAMS, ACTEW, Icon Water, Roads ACT, Action Buses, etc.).

All procedures set down in the ACT Environment and Planning Directorate web-site must 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 Territory and Municipal Services (TAMS) 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 must prepare and submit a pre-DA lodgement community consultation form to determine the type of community consultation appropriate to the Project.

All consultation must 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 TAMS Asset Acceptance**

The documentation and works delivered by the Contractor must meet the ACT Territory and Municipal Services requirements for Asset Acceptance.

The Contractor must be familiar with the TAMS Asset Acceptance process, liaise and coordinate with TAMS in the submission of required review documentation, utilise and comply with TAMS 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 TAMS requires bonds to be lodged for any part of the works, the Contractor must lodge such bonds, and is responsible for delivering works to a standard that will permit the bonds to be released and returned.

### **2.4. Building solutions**

Details of any building solution adopted under Part A0 of the National Construction Code Volume One which does not satisfy the Deemed-to-Satisfy Provisions of the National Construction Code must include all relevant plans and supporting documentation demonstrating compliance with the Performance Requirements.

Details of the alternative solution must 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 alternate solution must be agreed and supported by the Territory. The Contractor must 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 must 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 must 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, when using the workplace for a purpose for which it was intended.

The Contractor must complete Safety in Design reviews throughout all of the design phases under this contract. The Safety in Design assessment must 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 a Bushfire Prone Area of the Territory, the Contractor’s design must 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 must 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 must 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 must 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; or
- are recorded by the Environmental Protection Unit, Environment ACT as a known or potentially contaminated site (see below).

The Contractor must identify the location of all sites of natural or cultural significance in the area affected by the Project and must document and implement a Cultural Significance Management Plan to the satisfaction of the responsible Authority.

The Contractor must 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 must 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 must conduct a comprehensive Hazardous Management Survey. The Contractor must submit a demolition plan and the Hazardous Management Survey report to the Environment Protection Authority, and must make application for EPA Authorisation under the Environment Protection Act 1997.

Where necessary, the Contractor must 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 must 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 will be a food business premises (operating as either a registered food business or as a registered non-profit community operated food business) and must 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 must comply with ACT Health Protection Service standards and regulations for:

- suitable food contact surfaces;
- suitable lighting and ventilation;
- 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); and
- pest and vermin barriers and controls (screens, electric insect control, etc.).

## 2.10. ACT Fire and Rescue

The Contractor must initiate consultation with the ACT Fire and Rescue 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 must be incorporated in the design and the delivered Facilities.

### 3. Civil Engineering

#### 3.1. Design criteria

The Site civil works must also be in accordance with the current versions of the following:

- Relevant Authority Requirements – Guidelines and Standard Drawings;
- TAMS (Territory and Municipal Services) 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; and
- Australian Rainfall and Run-off.

##### 3.1.1. Peak Enrolment

The Contractor must make provision for all civil engineering elements for Peak Enrolment numbers for the School and any Non Mandated Community Facilities. This must 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 must be such as to allow for future development on the Site.

#### 3.2. Stormwater drainage

A drainage system must 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 must 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.

The drainage design must 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 must 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 must be obtained by the Contractor from the relevant Authority.

##### 3.2.2. Surface grades

External surfaces must 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.

##### 3.2.3. Recurrence intervals

Drainage systems must cater for the design storm event listed in Table 3 below and must have sufficient capacity to accommodate the design flow in accordance with the drainage condition requirements. The Contractor must give due consideration to the potential impacts that climate change may have on these design storm events.

**Table 3: 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 must 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 must firstly verify that the Design Deliverables sets building floor levels at or above the mandated levels and then must 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 must 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 must be set at least 600mm above the 100 year Average Recurrence Interval (ARI) flood level.

The Contractor must give due consideration to the potential adverse impacts that climate change may have on historic flood levels.

### 3.2.5. Pipe Sizes

Pipe sizes must not be less than:

- DN (nominal diameter) 150 for surface grated inlets and with a 150mm air-gap between base of down pipes and surface grated inlets;
- DN150 downstream of any grated pit or grated inlet; and
- DN225 downstream of any side entry pit.

Junction of pipes DN300 or smaller must 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 must be made at pits.

### 3.2.6. Pipe material

Pipe work materials must 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; and
- 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) must be rubber ring jointed.

The pipe class must be appropriate to the design loading conditions.

### 3.2.7. Pit structure

All pit construction must 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 must be subject to any restrictions imposed by the relevant Authority.

Pits must be designed to at least meet the same loading requirements as the pit cover or grate classification.

Pit spacing must be no more than 100m.

### 3.2.8. Pit covers

Pit covers and grates must be of a tight fitting bolted down design or have sufficient weight to prevent their easy removal. The classification of the cover or grate must meet the loading expected for the pit location.

Heel proof (“Heelsafe” or equivalent) type grated pit lids must 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 must 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 irrigation or gardens, or toilet flushing). Refer to the Section 13, Hydraulics Services for tank details.

Rain water tank installations must have ACTPLA approval and must comply with the ACT Rainwater Tanks Guidelines.

### 3.2.10. Water Sensitive Urban Design (WSUD) – Stormwater discharge

As a minimum, sediment traps and trash screens/baskets must 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, must 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 must be designed and constructed to avoid erosion, and minimise scouring in swales.

### 3.2.11. Provisions for maintenance

Drainage systems must 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 must be carried out to support the design of the pavements. The investigation must 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 must be designed for the appropriate traffic loads anticipated during their design life. Consideration must be given to the construction traffic and access for heavy vehicles such as fire-fighting, delivery vehicles, cleaning vehicles, waste vehicles, buses etc.

The design of pavements must 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 must 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 carparking must 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 must 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 must 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, must 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 must comply with the BCA and relevant Australian Standards in the design of pedestrian pavements, including the provision, passing areas, tactile ground surface indicators and stair tread nosings of suitable contrast colour. Compliant handrails and balustrades must be provided at all ramps, stairs and at the top of retaining walls. Handrails must not create opportunities for unauthorised access to roofs or windows. Designs must 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 must be provided for all paths (including steps and ramps) at the Site. The design for footpaths and pedestrian pavements must 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 in to adjacent surfaces;
- protection from root growth; and
- 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 must 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 must be coordinated with external paved areas developed as external learning environments.

Footpaths must 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 must be sealed with silicon sealant – colour to match the pavement colour. The footpath surface must grade away from the buildings.

Wheelchair and pram ramps must be provided at kerbs to meet all access requirements.

Pavements must not be constructed of loose granular materials (e.g. gravel or sand).

### 3.3.5. Hard Courts

External hard courts must deliver a flat, safe, resilient playing surface for running team games. The surface must be free from trip hazards and resistant to slipping. Hard courts must 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 must be set flush with the top of the hard court surfacing. The selection of a pavement material must be based on an assessment of the ground conditions and predicted seasonal ground movement behaviour at the Site.

Surface grades of the hard court must 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 must be graded to direct storm water and irrigation water away from the hardcourt surface. Positive drainage systems at the boundary must capture and convey runoff away from the hard court area. Hard courts must 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 must be linemarked, in multiple colours, to support the range of court games played at K-6 schools, K-10 schools or senior secondary schools (as applicable to the particular project).

### 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 must 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 must take into consideration the requirements of the TAMS Design Standards and Standard Specification for Urban Infrastructure Works, and referenced standards.

### 3.3.8. Vehicle Paved Area Materials

#### 3.3.8.1. Asphalt Pavement

Asphalt pavements must be heavy duty with appropriate base course and sub-base material placement and finished to meet design life requirements and in accordance with local Authority requirements, Austroads guidelines and the TAMS Codes of Practice, Design Standards and Standard Specification for Urban Infrastructure Works, and Standard Drawings.

#### 3.3.8.2. Concrete Pavement

Concrete pavements must be of a thickness and with appropriate reinforcement and base course material to meet design life requirements. Designs must conform to Territory requirements, and Cement Concrete and Aggregates Australia guidelines. The surface texture must be appropriate for intended use of concrete pavement and to ensure safe passage of pedestrians and vehicles.

#### 3.3.8.3. Segmental Pavers

Segmental pavers must 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.

#### 3.3.8.4. Pavement Ancillaries

All pavements must 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, must be adopted.

Appropriate subsoil (agricultural) drainage pipes must be used to avoid pavement failure due to water infiltration. In situations where there is expansive subgrade, the subsoil drainage pipes must not be permitted to come into contact with the expansive subgrade material and not less than 100mm of capping material must be provided around the floor of the subsoil drainage trench.

Kerb and channel and subsoil drainage must be designed and installed in accordance with local Authority requirements, Austroads guidelines and the TAMS Design Standards and Standard Specification for Urban Infrastructure Works and Standard Drawings.

## 4. Structural Engineering

### 4.1. Design criteria

The design must be based on and appropriate to a detailed understanding of the geotechnical conditions and terrain category at the Site.

### 4.2. Design life

All permanent structures will be designed to have a minimum design life of 50 years.

Modular relocatable buildings will 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 must be carried out to ascertain the relevant properties of the founding material for design and construction purposes.

Footing systems must be designed to limit differential settlements to levels within Australian Standard requirements and recommendations. Articulation of the footing system must be sufficient to prevent cracking or dislocation of building elements.

Floors must 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 must install underground root barriers to prevent damage to the buildings.

#### 4.2.2. Superstructure

The structural system must reflect the building plan and align with the most appropriate foundation system. The structure must 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 must be of a durability aligned with the nominated design life so as to ensure an efficient use of materials, labour and energy.

The Contractor must 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; and
- afford the maximum recyclability at end of life of the School.

#### 4.2.3. Deflection

Structures must 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 must be within tolerances set down by the Australian Standards. Specifically, the in-service deflections of structure supporting operable walls must 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) must 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 must 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 must be capable of withstanding a horizontal impact of 0.75 kN.

Walls must 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 must 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 must provide.

The School buildings must 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 must 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 rain storms, and increases in wind velocity), and must propose ways for the building fabric to be designed and constructed to mitigate such impacts.

### 5.1. Warranty Periods – Building Fabric

The Contractor must 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 must 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; and
- prevent vermin infiltration to external luminaires.

Vermin includes rodents, marsupials, birds, small mammals and insects (such as moths, wasps, and termites).

#### 5.2.1. Termite protection

Termite protection must comply with the relevant Australian Standard AS 3660.1 (as a minimum) and additionally with authority requirements where required. Termite protection must 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 must document a compliant physical termite barrier. Unavoidable penetrations such as service pipes, cable conduits and the like must 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 must limit or eliminate ledges and bird perches at external eaves and under-croft areas. Bird deterrent treatment must 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 must 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 must 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) must 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 must provide durable folded metal flashings and/or cappings at roof junctions, upstands, abutments, and penetrations through the roof. Flashings around roof penetrations must be continued upslope to the ridgeline. Gooseneck type flashings must be provided at cable and small pipe penetrations. Flashings must 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 must be coordinated with the ESD strategy for rainwater harvesting and re-use. Refer Section 8 (ESD and Energy Efficiency).

Consideration must be given to longevity when selecting roofing, roof profiles, fixing systems and roof plumbing materials. The exposure severity category for the Site must 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 must be calculated and allowed for, giving due consideration to recent trends of more frequent and severe rain storms and hail storms. All roof areas must 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 must provide a roofing system of low maintenance to avoid future disruption to the School.

The design of the School must 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, must not stain or contaminate and must 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 must be capable of supporting such loads without damage or distortion, failure of fixings, or loss of water-tightness;
- 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 rooflights;
- 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 goose-neck 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 must not be off-set in ceiling areas;
- avoids the need for any internal box gutters or valley gutters; and
- 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 must 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 must not be less than 2700mm.

The Contractor must consider the future difficulties of replacing sections of guttering formed to custom profiles. Where possible, the Contractor must utilise standard commercially available gutter profiles that provide the required capacity, and gutters must be installed in longest continuous lengths possible.

Rainwater gutters and downpipes must be sized to deal with calculated 1:100 year stormwater catchment. Where roof areas are used as catchment for recycled water, down pipes must be fitted with “first flush” type debris diverter.

Guttering must 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 must install gutter guards and to prevent blockage to gutters and damage to buildings.

Rainwater downpipes must be a minimum of 150mm diameter with detailing and arrangements that discourage unauthorised access to roof areas. Downpipes must 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 must be located in protected areas away from heavy student traffic. Downpipes must be installed exposed against external walls or posts, and restrained with fixing brackets. Downpipes must not be concealed behind wall cladding materials or concealed within eave spaces. Each downpipe must 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 must be identical in design and appearance to the original installation.

#### 5.4. Roof Access Hatches

The Contractor must provide roof access doors and hatches including ladders and stairs to be designed to satisfy relevant WHS Standards (doors to AS 2688). Doors or roof access hatches to be lockable. Roof access hatches to be sliding type hatches. Access to be via stairs not ladders.

#### 5.5. Fall Prevention

The Contractor must 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 must address all areas of roofing including access points, plant and equipment, gutter maintenance and skylights. The Contractor must 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 must provide level galvanised structural steel framed platforms, with support legs oriented to bear onto structural walls or columns below. The roof cladding must not be the support surface for plant loadings. The platform framing must 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 must be bounded by safety rails, and metal screens. Access to the plant platform must be by a safe access walkway (specified elsewhere in this section).

The Contractor must 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 must 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 must 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 must provide all required cladding, including all finishes, fixings, sealants, flashings and trims and these must be suitable for its location and the intended function. The cladding system must provide an acceptable level of maintenance to reduce future disruption to the School.

Consideration must be given to longevity when selecting walling and cladding materials. The exposure severity category for the Site must be determined, giving consideration to local risks of corrosion from environmental or industrial sources.

The design of the School must 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 must not stain or contaminate and must 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; and
- 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 must provide:

- long term durability;
- resistance to vandalism damage; and
- 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, must 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 must 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 BCA Section J.

The design of the School buildings must 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 must 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); and
- 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 must be insulated as for external walls.

### 5.9.1. Floor insulation

Floor insulation must have minimum total R values sufficient to achieve the energy performance requirements set in Section 8, ESD and Energy Efficiency.

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 store rooms (materials technology, school bulk store, sports equipment store and grounds equipment store), a layer of perforated white polythene coated foil must 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 must 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 must 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 must 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 must 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 must be at a height that will be out of reach of students standing on chairs and tables. Services bulkheads (where provided) must be adjacent to a wall, must not drop below 2400mm (measured from finished floor level) and must not exceed 5% of the floor area of the space in which they occur.

Flush painted plaster ceilings must be provided in store rooms, service rooms, student toilets, kitchens and change rooms. Flush painted plaster must be used to encase bulkheads below 2700mm ceiling height. Ceilings must be constructed to deliver required fire ratings where specified in the Functional Brief or in this Technical Specification.

Ceiling installations must 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 must provide light reflection unless this is inconsistent with the function of the space.

Suspended ceilings, where provided, must:

- 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; and
- provide special sized purpose-made panels to fill non-standard margins, openings and penetrations.

External eaves and building projections must 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 must 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 must be installed which:

- are of a material that matches the adjacent ceiling in appearance and colour;
- are fitted with a security latch; and
- have a surface which is flush with the ceiling surface.

### 5.12. Windows

The Contractor must provide external windows and internal glazed screens to meet the required performance standards and the requirements of applicable codes. All external windows must be installed to ensure that the external façade is weatherproof.

The design of the School must, 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 must 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, must not stain or contaminate, and must 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; and
- 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 must ensure that all 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; and
- not hazardous to persons passing by windows internally or externally when in use.

Design consideration must be given to (preferably cross flow) ventilation, and must, wherever possible, provide natural lighting from two opposite sides of an activity area.

Where the natural ventilation system depends on accessible windows being opened out of hours when the building is not occupied, the windows must be fitted with barriers or screens to resist intruders and vermin.

Levels of natural and artificial lighting must comply with the requirements as detailed in Section 8 (ESD and Energy Efficiency).

The thermal performance of glazed elements must be sufficient to achieve the energy performance requirements set in Section 8 (ESD and Energy Efficiency).

Windows must be fitted with internal blinds that cover the full extent of the glazing. In selection of internal blinds or shade solutions, consider 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 must be specified in accordance with overall façade performance, including glazing, sun shading and room activities. 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 must be at least 1600mm above the floor when the blind is in its lowered position, and must be securely fixed against the wall.

Where internal glazed screens are provided, consideration must 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 window sill.

### 5.13. Doors

The Contractor must 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; and
- 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 must 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 must 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 must 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 must open in the outwards direction. The Contractor must 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;
- 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;
- are weather sealed 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 a required exit, it must be a single-action opening door, operable from the inside; and
- are of low maintenance to prevent disruption to the School.

Entry and exit doors that are subject to continual heavy use must be constructed for strength and resilience against wear, and against accidental and deliberate damage. Glazed doors must have at least one cross rail to stiffen the door and to reduce the size of glass panels. Doors must be fitted with closers with the capacity to close and latch the door without slamming and to retain the door against wind gusts, however doors must be operable by any User that can be expected to be at the School.

Air grilles in external doors must 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. Automatic operation doors

The Contractor must provide external entry to the reception lobby via a paired set of automatic operating glazed sliding doors, forming a wind lock. The lobby space must be sized, or the automatic doors offset, so that a single user will not activate both doors at the same time.

Automatic doors must 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;
- auto doors to be capable of locking closed by control switch; and
- adjustable dwell time for door operation (including the option for a winter setting – reduced door opening width).

The reception lobby must 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 must be associated with the person access door to permit external after hours release by electronic key system. The person access door must also have an internal after hours release button (mushroom cap push button door release).

### 5.13.3. Internal doors

Where required, the Contractor must provide internal doors which possess the following qualities:

- must be solid core to deliver required durability and acoustic isolation;
- must 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, Building Distributor Cabinet No.1);
- must provide adequate sound reduction for the intended usage as detailed in Section 15 (Acoustic Engineering); and
- (where a general passage door) must be operable without requiring power assistance for young/disabled person.

To assist users to identify points of access, internal room entry doors must be painted in a contrast colour to walls. Doors to storage cupboards and service rooms must be painted similar to the wall colour.

Glass viewing panels must 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 must suit student eyeline when doors are used by students, but should 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:

- 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; and
- general teaching and learning areas where spaces are accessed via a hinged or sliding door.

Air transfer grilles must not be used in doors where such installation will compromise privacy or the required acoustic isolation or fire rating of a space.

The door connecting the School reception area with the school internal circulation network must be a security door with electric strike, controlled by release button from the general office and by key. The door must have internal after hours release button (mushroom cap push button door release).

#### **5.14. Door and Window hardware and keying**

The Contractor must provide all door, window and other finishing hardware and related items necessary to operate the School.

Without limitation, hardware will 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 must be secured by top and bottom bolts.

The Contractor must 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.

##### **Outline scope of secure locking**

The Contractor must 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, the main ICT room (BD1) and other BD cabinets or spaces, ICT technician's office, sports store, cleaner's stores, music stores, electrical and mechanical switchrooms, communications 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 store rooms, pantries, etc.;
- rooms / spaces that may contain valuables or controlled substances (e.g. the first aid room, chemical store rooms, etc.); and
- storage cupboards and secure drawers in rooms (keyed alike within a room only).

TAMS is responsible for the preparation and issue of masterkeyed cylinders and keys for the Territory's schools. The Contractor must coordinate with TAMS during the construction phase to ensure the timely provision of the required security hardware. The Contractor must provide TAMS 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 must coordinate input from the Education Project Officer and TAMS, so that an agreed masterkey hierarchy can be developed. SSICT is noted as a stakeholder that must be consulted during the preparation of the keying schedule.

Key codes must 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 must limit and contain the risk of re-keying if any single key (excluding a master key) is lost.

The Contractor must use temporary cylinders during the construction phase. The temporary cylinders must be removed and replaced with permanent TAMS issued cylinders immediately prior to handover.

### Hardware requirements

The design of the School must 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 must be of appropriate size, height, materials and fixing for its application and usage; and
- 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 must as a minimum provide all doors and windows hardware and all associated work that:

- is robust and heavy duty;
- is suitable for a schools environment;
- is suitable for the location and the intended function of the doors;
- is suitable for the mass of the doors; and
- is corrosion-resistant or protective coated to prevent corrosion.

The Contractor must as a minimum provide a physical key lock system to doors that meets the following requirements:

- locking hardware can accept cylinders issued by TAMS;
- the cylinders and handles are appropriately mounted to allow for particular requirements such as child care areas;
- keys are fitted with identification tags; and
- keys and key lock cylinders are stamped with the key codes.

Lever handles must 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 must be provided. Closers must 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), must 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, must be configured to support the ACT Education Directorate's lockdown requirements - thereby controlling unauthorised access and permitting school students and staff to shelter in secure locations.

Where the Contractor chooses to install an electronic access control system at the School, the Contractor must:

- 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;
- 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; and
- ensure that the key card system is secure and cannot be copied by individuals.

#### 5.14.1. Kick plates

Kickplates to both sides of flush panel doors must 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.

#### 5.14.2. Door stops

Door stops must be provided to prevent doors or door furniture striking adjacent walls, fixtures or other surfaces. Door stops must be robust and resistant to damage by vandalism.

### 5.15. Operable and adaptable walls

Where proprietary acoustic operable walls or adaptable screens and partitions between spaces are proposed as part of the Contractor's design solution, the Contractor must 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 must be durable and suited to repeated stacking and un-stacking of the panels.

Where necessary, a pass door within the operable wall must be provided to facilitate access to a contained space. Operable walls must have an acoustic performance rating to match adjoining partition systems as detailed in Section 15 (Acoustic Engineering).

Operable walls must 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 must 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; and
- fitted with a reed switch (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.

### 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 will be powdercoated over a galvanised steel substrate.

The door assembly must 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 must meet the following requirements:

- no risk of injury to adults or children when the door is being opened or closed. Guards must 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 read switch (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; and
- where the door size or weight requires electric motor drive for opening and closing, the controls must include an emergency stop button.

### 5.18. Stairs and ramps

The Contractor must 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 must be provided where required;
- if handrails are required, two handrails at different heights must 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; and
- ramps must be designed for safe and accessible wheelchair use in accordance with relevant regulations and Australian Standards.

## 6. Building Finishes

The Contractor must provide finishes that:

- meet the requirements of ESD strategy – refer Section 8 (ESD and Energy Efficiency);
- must have appropriate acoustic and noise reduction capabilities in accordance with Section 15 (Acoustic Engineering);
- are of suitable colour schemes and contrasts; and
- are durable and resistant to exposure, weathering and general wear and tear and, where required, fire resistant.

Where possible, the Contractor must use finishes that:

- use regenerable materials, from sustainable sources;
- have minimal embodied energy content; and
- afford the maximum recyclability at end of life of the School.

External finishes must 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 must be used.

### 6.1. Warranty Periods – Building Finishes

The Contractor must 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 must comply with all relevant Australian Standards and the recommendations of the material manufacturers.

Masonry works must include all associated mortar, lintels, ties, control joints, embedments, joint insertions, and sealants.

The design of the School must 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); and
- 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 must 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 must be free of defects and smooth over each element, and must have a consistent appearance over the entire work;
- galvanizing must 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 must be carried out to architectural grade and have a uniform patina and texture over the entire visible surface without defects or rough patches; and
- where pre-coated materials are subject to on-site welding, cutting or similar work, the applied protective coating must 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 must 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 must 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; and
- all associated work.

Metalwork must satisfy the following requirements:

- protected against corrosion;
- adjacent materials and products must 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, must not stain or contaminate, and must not cause visual or structural defects in adjacent materials;
- fixings and framing must 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 must be evenly and neatly located and aligned;
- visible fixings in accessible areas must be vandal resistant;
- where required to be finished flush with adjacent surfaces, visible fixings must be countersunk;
- trafficable surfaces must be slip resistant;
- metalwork must be fabricated to a high standard fit and finish;
- cut edges, drilled holes, joints and surfaces must be finished clean, neat, free from burrs and indentations. Sharp edges must be removed without excessive or uneven radius;
- surface finish, colour and texture must be continuous and without variation;
- free of sharp edges or projections which could cause injury to users; and
- exposed fixings that are subject to human contact must be recessed, smooth and flush.

### 6.5. Equipment cages

Externally installed mechanical equipment, valve and meter assemblies, etc. must be protected using fabricated metal lockable security cages that only permit access to authorised personnel.

### 6.6. Bicycle racks

The Contractor must provide racks for leaning support for bicycles and scooters in the bicycle sheds. Racks to 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.

### 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 fascias, screens, framing and cladding to pergolas, shade structures and covered walkways, posts, fences, gates, platforms, decking, seats and benches, retaining walls, etc.

The Contractor must provide all required framing, fit out and trimming carpentry, including timber fixings and accessories, and must 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, substrates 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 must 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 must be 'building grade' if concealed, or 'appearance grade' if visible;
- fixings for timber framing must be suitable corrosion resistant types as required to assemble and hold the work in place, and are selected for correct size and spacing; and
- Medium Density Fireboard skirtings / architraves must not be used in wet areas.

The grades of timber veneers must be at a minimum:

- select grade, veneer quality A, for visible surfaces to have clear finish or to have no coated finish; and
- general purpose grade, veneer quality B, for other surfaces.

Timber that has been pressure or dip treated with copper-chromium-arsenate (CCA) preservative must not be used.

## 6.8. Walls and linings

Every space or room must 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 must 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, store rooms, materials technology workshops, student toilets, etc.), must 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; and
- have continuous thermal insulation provided to minimise heat gain or loss from outside.

Wall surfaces and finishes must 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; and
- 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 must 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 must assist in the management of the acoustic performance of the space by controlling noise leakage and noise intrusion.

Wall layouts must 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 must 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)) must be provided to the ACT Project Manager, progressively as wall framing proceeds. The Hold Point will be released following acceptance, by the ACT Project Manager, of the Contractor’s Digital photograph records submission.

### **6.9. Tiling**

Where floor or wall tiling is proposed in the works, the Contractor must 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 must ensure these are appropriate for the conditions and performance requirements.

The Contractor must 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, must not stain or contaminate and must not cause visual or structural defects in adjacent materials;
- have joints that are plumb, even and neat;
- must 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 must be waterproof and resistant to water pressure and vapour pressure, condensation and corrosion, and must remain intact and properly fixed to the substrate under all conditions; and
- where splashback tiling is provided in wet areas, this must rise a minimum of 500mm above the benchtop or fixture.

## 6.10. Floor finishes

The Contractor must 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 must be appropriate for the use conditions and may include two or more flooring finishes in the one space.

Floors and floor finishes must 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 must be provided at junctions of dissimilar flooring materials. The finish of adjacent floor finishes must be to a common surface datum, so that no trip hazard is formed. Metal movement control cover plates must be provided in floor finishes where structural control joints have been formed in concrete slabs.

The Contractor must as a minimum ensure that the flooring finishes are:

- highly durable and 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; and
- installed with minimal undulations.

### 6.10.1. Carpets

Flooring to teaching, office and administration zones must be anti-static commercial grade carpet or carpet tiles, consistent with room use and traffic.

The Contractor must 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 must 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 the 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; and
- are laid in a single area and must 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 must 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 must 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 must be used where the function of the space involves risk that staining liquids or corrosive chemicals will be spilled. An anti-static type flooring must be installed in the Building Distributer cabinets or spaces, and in Learning Community or Specialist areas where anti-static properties are appropriate.

Resilient sheet flooring must 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 must, 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; and
- 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) must 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 must 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; and
- 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;
- must 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; and
- 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 must comprise a sprung timber flooring (as for sports floor), with an applied finish suitable for dance, drama and similar activities.

### 6.10.7. Floor mats

At external entrances, provide internal walk off mats to prevent tracking of rain water, 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 must both be level with the top of the matwell perimeter frame. Mats must 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 must 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; or
- 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 must be used. Skirtings must be installed to a level horizontal line fitting flush against floors. Edges must butt together to form tight neat joints showing no visible open seam. Skirtings must 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 must 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 store rooms, utility rooms, plant and equipment rooms, the Contractor must 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 must ensure that all epoxy flooring and all required components:

- are applied in accordance with the material manufacturer's recommendations;
- are formed to cover integral skirtings;
- are formed to fall to grated gullies where required;
- must be safe and appropriate for their particular use; and
- 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) must be finished with an appropriate applied protective coating system. This requirement includes installations and works associated with building engineering services (including pipework).

The Contractor must 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 will 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 must 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 must 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, tinters and stainers must 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) must be used;
- internal paints must 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 must be from the same product batch. Inconsistency in paint is not acceptable; and
- ultra-violet resistant paints and coating products must 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. must be painted in high visibility colours.

Freedom from toxic ingredients: Paint must 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 must 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 must, as a minimum, provide all joinery required to support the functionality of the School. Joinery works must 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 must 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 fitout to storage rooms, cleaners stores, sports stores, which considers in each case the range of items that must 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; and
- stainless steel and chemical resistant laminate work benches and cabinets in the science and technical areas and similar functions.

The Contractor must 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) must 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; and
- 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 must 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 must 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 countertopping;
- stainless steel;
- chemical resistant laminate or solid acrylic polymer countertops (for science laboratories, etc.); and

- laminated solid timber, solid moisture resistant medium density fibreboard (MRMDF), or face veneer plywood for technology workbenches.

Handles must be robust, simple satin chrome plated metal and sourced from generally available production lines. Consistent with the principles of inclusion, handles must 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 must have common substrate and finishes and be a minimum thickness of 18 mm MRMDF. There must be a white melamine finish to all interiors including drawers and shelves in enclosed cupboards. Finishes must be applied to all surfaces and edges, including edges facing floors. Edges must be finished with solid colour rigid high impact PVC edging to match the selected cupboard exterior laminate colour.

Shelves must 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 must be hung on 110° or 180° fully concealed and adjustable hinges. Doors must 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 must be fitted with steel and ball bearing full extension sliding drawer runners.

Impervious splashbacks must 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) must be detailed to ensure durability and resistance to water ingress and degradation.

Where possible, storage must be incorporated under benchtops, except where accessibility provision is required.

### 7.1.1. Accessibility and inclusion

The Contractor must 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 must facilitate use by students and visitors who may use wheelchairs or the like. The wheelchair accessible areas of the reception counters must not be “tucked to one side” but must be readily identifiable and easily accessible.

### 7.1.2. Special joinery fittings

Where necessary to deliver or compliment 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 desk tops;
- wardrobe hanging rails; and

- joinery locks 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 pigeon holes

Each staff lounge must be provided with a custom fabricated rack of named pigeon holes (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 must 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 must 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 must allow for vertical adjustments at 50mm intervals.

The Contractor must 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); and
- variants of the above description suited for specific storage functions.

### 7.1.7. Art and materials technology storage

The Contractor must 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 must 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 must 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 must 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 must 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 must include class set quantities and must include balls for a variety of sports, racquets, bats, mats, hoops and the like.

## 7.2. Display surfaces

All electronic, mobile and fixed interactive whiteboards and AV displays must be appropriate for the intended users. They must be available for all users to comfortably reach.

### 7.2.1. Display boards

Innovative solutions for the displaying of student work should be considered with different materials incorporated. The Contractor must 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 must comply with the following requirement:

Display boards must:

- be of an appropriate thickness for their intended function;
- confirm to AS/NZW 1859.4, when a fibre insulating board is used;
- be sufficiently supported and fixed to the wall or if demountable, fixings must 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); and
- be integrated into building wall design and cladding, so as not to appear as an added element.

### 7.2.2. Whiteboards

Where whiteboards are provided to meet the requirements of the Functional Brief, they must 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 must be attached to the building substrates to provide sufficient support;
- the surface must be suitable for use with fast-evaporation, dry ease pens; and
- pen rails must be fixed to the full width of the bottom edge of the board.

### 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 must 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 must 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 must 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

Where required for the proper function of a space, or where identified as required in the Functional Brief, the Contractor must provide window coverings such as curtains, blinds, drapes or similar décor. Window furnishings will be required to moderate daylight levels through windows, and to moderate the privacy of spaces served by windows.

Window furnishings must 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 must not emit excessive smoke or dangerous fumes when subject to fire conditions and must conform to the relevant Australian Standards.

The Contractor must provide blinds to each window with an external view (excluding highlight windows). Blinds should 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 must 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 must be provided with stage curtains.

Stage curtains must 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 centres;
- 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; and
- 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 will be additional to, and coordinated with the installation of acoustic operable walls that secure the opening.

#### 7.5. Sanitaryware

The Contractor must 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 Long Term Enrolment 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 must 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 must allow for supervision of open areas from the entrance door. Where possible, toilets must be accessible from inside as well as outside the school building. Consideration must 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 must provide all sanitary fixtures and fittings connected to service pipe work. The work must include all required anchorages, fixings, lugged elbows and the like as necessary for a robust, durable, impact resistant installation.

The Contractor as a minimum must 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, must not stain, corrode or contaminate and must 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; and
- 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 must 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)

### 7.5.2. Toilets

Toilets must 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 must have a double flap toilet seat. Single flap toilet seats must be provided for student toilets.

Toilet suites for pre-school students must be “Junior suite” type – suited to infant/ junior applications. For Pre-school student toilets must have single flap seat, and may include an exposed cistern.

Where required, disabled access toilet pans and ambulant access toilet pans must 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 must provide include space provision for the placement of sanitary disposal units.

### 7.5.3. Urinals

The Contractor must determine in its design whether male toilets will include separate urinals, or will rely on toilet pans alone. Where urinals are provided, the installation must meet these requirements:

- Ventilation, flooring, wall finishes and all detailing must be designed to facilitate cleaning and to control odours.
- Flushing to male student urinals must be by a sensor technology that prevents false detection and that can detect blockages.

- Staff urinals: Wall mounted vitreous china urinals must 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 must 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 must 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 must be provided with 1.6mm thickness, grated platform type (no step) with concealed in-wall cisterns and automatic flushing.

#### 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 must incorporate an overflow.

Student hand wash basins: Must be vitreous china basins, wall hung and mounted at an appropriate height. Basin support brackets must 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 plugs are required for hand wash basins.

#### 7.5.5. Hand wash troughs

Hand wash troughs (where used) must 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 must be nominally 300mm width x 150mm depth with taps at nominal 450mm centres. Trough installation must 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.

#### 7.5.6. Drinking troughs and fountains

The Contractor must provide distributed drinking troughs and fountains around the School including specific provision of drinking fountains internally and externally designed for access by users with disabilities. Drinking fountains must be convenient to external sports and play activity areas.

Drinking fountains must be stainless steel – wall mounted or pedestal mounted, cantilevered with single bubbler with an automatic shut-off function. Drinking fountains heights must be coordinated with the age levels of students, and provision must be made for wheelchair accessible drinking fountains.

Drinking troughs must be wall mounted 1.2mm thickness satin finish type 304 stainless steel trough with rear upstand skirt to conceal pipework, and holed for bubbler faucets. Trough dimensions must be nominally 300mm width x 150mm depth with bubbler faucets at nominal 450mm centres. Trough installation must be fixed into solid substructure and resist damage by vandalism (including climbing). Trough mounting heights must be coordinated with the age levels of students.

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 trough must include a water bottle filler spout (in accordance with the ACT Healthy Weight Action Plan).

Internal drinking fountains must have an impervious floor finish around the fixture.

#### 7.5.7. Sinks

Inset stainless steel sinks must be provided with single or dual bowls and integral single or double drainers. The Contractor must provide the number of bowls, location of bowl(s), height of bowls, and overall length of sink to suit the particular application. Sinks must 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 must provide the number of sinks, to suit the teaching and learning requirements, and the number of students. All laboratory sinks must 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 must 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

Clay sinks must be inset stainless steel, with extended standing drain outlet, and clay interceptor traps. Clay interceptor traps must be located external to the building (not internally under bench) and be simply accessible to facilitate periodic maintenance and cleaning.

### 7.5.11. Laundry troughs

Laundry troughs must be inset stainless steel, 45 litre capacity, with single tap hole and rinse by-pass co-ordinated with washing machine location.

### 7.5.12. Cleaner's sinks

Cleaner's sink must 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 must provide showers to student / staff changing rooms. Showers must be safe, self-draining and designed to allow for privacy for each user. DDA accessible showers must be fitted with stainless steel grab rails, a shower seat and adjustable shower curtains.

Shower heads to general purpose showers must be anti-vandal fixed head type outlets.

Shower heads for disabled use must comprise a vertical wall rail, hand shower on flexible hose, integral soap dish and wall bracket.

### 7.5.14. Floor waste gulleys

The Contractor must 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 must 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 must 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 must provide robust and tamper proof tap fittings with either timed delivery or otherwise designed to meet ESD water saving requirements as detailed in Section 7.5.1.

Tap fittings and fixtures must be satin chrome plate finish on metal.

Cold water tapware must be coded "blue" and hot water tapware must be coded "red". Cold water tapware must be fixed on the right-hand side of the fixture and hot water tapware must be fixed on the left hand side.

Laboratory type tapware must be high goose-neck type, bench mounted or sink mounted and must be acid resistant to suit the particular application.

Consistent with the principles of inclusion, taps must generally be controlled by lever handle. Taps in kitchen situations must be pillar mixer taps. Drinking fountain tapware must be lever spring-action drinking cocks with mouthguard and 100mm long flanged horizontal extension to the tap. Hand wash facilities for students must have push button timed delivery taps, with timed settings adjustable across at least two time periods. Taps and troughs must be located and installed in a manner which minimises damage or vandalism.

Tapware must have a maximum flow rate of three litres per minute for toilets and small basins and a higher rate for laboratory sinks, kitchen sinks, etc.

Where cleaners' taps are provided these must be positioned at a height to allow a bucket to be easily filled and be fitted with anti-vandal tap spindles. Cleaner's taps must not be fitted with a threaded spout, so that hoses cannot be installed and used inside buildings.

External taps must be fitted with anti-vandal tap spindles and be threaded to take a standard hose connection. External taps that deliver recycled water must have permanent safety warning signage above the tap. Where potable water is delivered to standpipes adjacent to sand pits, the operation must be simple and with automatic shut-off.

Hands free tap operation must 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 must 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 must not be provided in student toilet areas);
- soap dispensers: The Contractor must 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 rooms;
- shower seat: Fold away type slatted shower seat incorporating safety spring clutch mechanism; and
- "sharps" container - 2 litre capacity wall mounted lockable and labelled.

## 7.7. Electric Hand Dryers

The Contractor must provide hand dryers suitable for a 240 Volt, 50 Hz supply adjacent to all staff and student hand wash basins (but excluding hand basins used by pre-school children). Hand dryers must accommodate two hands simultaneously, have touch-free infra-red sensor activation and deliver a 10 second hand dry period.

The noise rating must be less than 50 dB(A) at 1 metre – measured with hands in the airstream. Assemblies must be complete with concealed mounting hardware to suit the wall type. Mounting heights must suit the height of users.

## 7.8. Toilet Partitions

The Contractor must 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 on the FF&E Schedule the Contractor must 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; and
- fixed at the appropriate height for their intended users.

## 7.10. Signage

### 7.10.1. General signage requirements

Signage must 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 should support the signage through pedestrian layout, colour and material referencing.

The Contractor must 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; and
- statutory signage (compliant with the BCA and other relevant codes and standards);

The Contractor must 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 must prioritise clarity and easy comprehension and signage layouts must avoid ambiguity. Different forms of signage and graphics must be considered and integrated with the school design. The Contractor must 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 must be in English, the Contractor must not assume the audience for these signs has fluency in written English. Abbreviations must be avoided. Where appropriate, the Contractor must use graphic symbols and incorporate internationally recognised pictograms. In primary schools and in Learning Support Centres,

appropriate picture signing and graphics must be used where possible to describe the function to assist primary age and pre-literate students.

The Contractor must 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 must identify routes to and from frequently used facilities from locations where people gather or begin their journey. Along routes, signage must confirm continuing routes to reach destinations, and identify points of divergence where common paths break into different streams.

Signplate materials, structures, coatings and finishes must 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 must 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 must design and construct support frames, brackets, concealed and/or vandal resistant fixings, backboards and the like. Where signs have accessible panels, these must be easily secured and remain suitable for long term regular access.

Metals and fixings must be corrosion resistant and suitable for their location and exposure conditions. Adhesive fixings must not be used.

### 7.10.2. Statutory signage

The Contractor must 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 switchroom, electrical distribution boards, Comms/ICT spaces, mechanical plant rooms, gas 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; and
- 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 must 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 must be given to available view lines, and directions of spectator approach (pedestrians and motor vehicle travellers) when deciding on the optimum location for this sign.

Provision of illumination to this signage is not mandatory.

#### 7.10.4. Double sided external school sign

The Contractor must 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.

The digital display field must 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 must be fully programmable, using a mobile 3G data system for data communication. The Contractor must 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 must include a time clock function, so that hours of operation of the active illuminated display can be programmed.

Where feasible, consideration should 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:

- Education Directorate External School Signage Design Strategy.

#### 7.10.5. Naming of schools and functional areas

The Contractor must 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 must 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 Foundation–Year 10. It is the responsibility of the school to decide which language(s) will be taught explicitly in that school.

The Contractor must allow for 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 chose 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 must 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 must submit for review artwork proofs for each multi-lingual sign to eliminate errors from manufactured signs.

#### 7.10.8. Door numbering

The Contractor must 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 must 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

The Contractor must 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.); and
- 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 must 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 must select appliances with an Energy Rating within 1 star of the highest rated product of that type. 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 must be rated 5 star WELS (or better) for water consumption.

### 7.11.2. Ceiling fans

The Contractor must provide high efficiency ceiling sweep fans to all teaching areas, including libraries and administration areas thereby ensuring adequate air movement in accordance with Section 10 of Volume 2, Part C. Controller switch plates must be resistant to vandalism. Push button preset controllers are preferable to variable controllers with a turn knob and spindle.

### 7.11.3. Fume cupboards

Where identified in the Functional Brief or in the FF&E Schedule, the Contractor must provide and install fan vented laboratory fume cupboards. The construction of the fume cupboards and the installation must comply with all relevant regulations and Australian Standards. Fume cupboards must 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 must have vertically sliding safety glass screens and a control panel with digital displays and emergency power shut off. Fume cupboards must be supplied with power, potable water and a plumbed laboratory sink. The rising exhaust duct must be concealed behind a matching removable infill panel. When in operation, generated fan noise must not cause nuisance to educational activities in the space.

### 7.11.4. Stoves, ovens and cooktops

The minimum requirements for cooking appliances are as follows:

**Stoves:** Upright, stainless steel finish, with gas 4 burner cooktop, griller and electric oven. Fold down door to oven. Removable enamelled trivets to each of the gas burners. 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:** Inset, self-rimming, stainless steel finish, with front or side controls and piezo ignition. Cooktops must have a minimum of 4 burners, with removable enamelled trivets to each burner and a cooktop surface designed to contain liquids.

#### 7.11.5. 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.

#### 7.11.6. 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 staff lunch rooms, 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.

#### 7.11.7. Chilled water units

The Contractor must 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 can be via a single post dispenser.

#### 7.11.8. Dishwashers

Domestic Dishwasher:

The Contractor must 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; and
- façade panel and door panel that can be integrated with joinery and décor.

Commercial dishwasher:

The Contractor must 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; and
- drain pump with backflow protection valve.

Laboratory glassware dishwasher (P-10 schools and Senior Colleges):

The Contractor must 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 and Energy Efficiency

### 8.1. Overview

This section describes the minimum ESD requirements for the Project. They represent the minimum requirements and do not limit the Contractor's responsibility to deliver effective and innovative ESD strategies at the Site.

The Contractor must provide ESD designs that consider and respond to the circumstances of the Site. The range of ESD initiatives proposed by the Contractor must respond to a wide range of sustainability issues (including material sourcing, landscaping and ecological impacts, transportation), in addition to the minimum requirements described in this section.

For any proposed ESD initiatives, the Contractor must design them in accordance with recognised standards and benchmarks, as defined in Green Star or other recognised documents.

### 8.2. Integrated design

The Contractor must provide a School that, through appropriately integrated design, achieves the stated energy, thermal comfort and lighting requirements predominately through the use of passive ESD infrastructure and environmentally sensitive design approaches.

#### 8.2.1. Energy performance - design

The School must be energy efficient throughout the Operating Phase, as defined by the performance requirements in this section.

The School must 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 must 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 must be achieved from reduction in greenhouse gas emissions across all buildings on the Site.

These improvements must 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 Contractor's design for 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.

#### 8.2.2. Energy performance – on-site generation

The Contractor must provide on-site photovoltaic energy generation to cover at least 15% of total estimated energy consumption (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 system design requirements.

The Contractor must note that any proposed system sized over 100kW (or over the current definition for the Small-scale Renewable Energy Scheme (SRES) as per the Clean Energy Regulator), must 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.

Photovoltaic energy generation systems must be:

- installed to be resistant to deliberate and accidental damage;
- protected against theft;

- located to be free from overshadowing from building elements and trees, and
- installed in accordance with the product manufacturer’s installation instructions.

### 8.2.3. Energy performance – air permeability

The Contractor must design and construct the envelope of all mechanical ventilated and mixed mode buildings so that, at the end of construction, those buildings will meet the performance requirements of a pressurised building air leakage test, when conducted in accordance with one of the following standards (or equivalent current standard):

- ASTM E779-10; or
- ATTMA TSL2.

Air permeability of the building (or buildings) must meet the best practice guidelines outlined in CIBSE TM23 2000 (or current equivalent standards), or as specified in the latest version of Green Star Design and As Built.

Table 4 shows the guidelines for office buildings from Green Star Design and As Built v1.1, which are the most appropriate benchmark currently published, however guidelines for schools should be used if available in later tools or standards.

**Table 4: Air permeability guidelines**

	Air Permeability (m <sup>3</sup> /hour/m <sup>2</sup> at 50 Pa)	
	Good Practice	Best Practice
Office Building (Naturally Ventilated)	7.0	3.5
Office Building (Mechanically Ventilated)	3.5	2.0

### 8.3. Thermal comfort

The Contractor must provide functional and occupied spaces (including teaching spaces, staff offices etc., unless other temperature requirements are set in Section 10 (Mechanical Services)) that can achieve a Percentage of People Dissatisfied rating of ≤10%, as defined by the most recent edition of American Society Heating Refrigerating and Air-Conditioning Engineers 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 must be achieved on a design day for the Site, as defined in Section 10.1.2 (Design Day Internal Temperatures).

The above performance must be achieved for at least 95% of each functional and occupied space.

Transient spaces, such as enclosed corridors, do not have to comply with this requirement. Corridor and circulation areas that are adjacent to and integrated with a functional and occupied spaces, must comply with thermal comfort requirements.

The modelled design for each building must be the same as the one used to demonstrate compliance with the energy and lighting requirements.

For each building, the Contractor must 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).

### 8.4. Natural Lighting

To reduce the need for the use of artificial lighting, the Contractor must 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 must 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 must 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 must 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.

The daylight model must be consistent with the design used to demonstrate compliance with the energy and thermal comfort requirements.

Placement of external covered ways and placement of trees near buildings may affect window exposure to daylight. The masterplanned provision of covered ways and trees must be considered when modelling daylight for buildings and modelling shading onto buildings.

## 8.5. Water performance

The School must be water efficient and match the quality of water used to that needed for each application.

The Contractor must ensure that the School complies with the *Waterways: Water Sensitive Urban Design General Code*. Mains water use must 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 must provide appropriate and justified calculations demonstrating compliance, such as using the latest Green Star Design and As Built Potable Water Calculator and Potable Water Guide. The 40% reduction includes water used within buildings and for irrigation, but does not include water used for fire test systems.

Water storage must be in the form of either below ground tanks, above ground tanks, or a combination of both. Installations for above ground rainwater tanks must be in accordance with *Rainwater tanks: Guidelines for residential properties in Canberra*, the relevant Building Code of Australia and Australian Standards. The Contractor must obtain Environment and Planning Directorate approval for Rainwater tank installations.

The Contractor must provide the Directorate Project Officer with an As Built report (in an approved format) showing actual performance based on supply authority invoices and metering data, for a 12 month period measured after the School student enrolment has reached 80% of Long Term enrolment.

### 8.5.1. Distribution

Regardless of the extent that non-potable water is provided, the Contractor must provide separate 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. Mains recycled water

Where Class A recycled water is available from Icon Water Limited, the Contractor must use recycled water for end-uses that do not require potable water.

### 8.5.3. Stormwater

Stormwater quality must meet the following minimum targets, in comparison to a catchment area with no water quality management controls<sup>1</sup>:

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 must meet the following minimum performance targets:

<sup>1</sup> Authorised by the ACT Parliamentary Council, *Waterways: Water Sensitive Urban Design General Code*, Section 3.2

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 must be considered to help achieve the stormwater quality 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;
- Inclusion of permeable surfaces in carparks and other hardstand areas (also see Biodiversity requirements); and
- Rainwater capture and reuse.

#### 8.5.4. Fire protection water use

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 or shut-off points.

### 8.6. BMS, Metering and monitoring

#### 8.6.1. Building Management System

The Contractor must provide a Building Management System (BMS) that:

- improves the performance and energy efficiency of mechanical services;
- controls and monitors the indoor environment, thermal comfort and air quality;
- controls, monitors and records energy and resource consumption from all metered services; and
- enables centralised scheduling and adjustment of set-points for Plant and equipment.

#### 8.6.2. Monitoring system

All sub-meters for all metered services must be connected to a centralised computer based monitoring system which has the following minimum capabilities:

- comprises a network of distributed field controllers reporting to a central programmable controller;
- central controller records all data (including energy and resource consumption and maximum demand data) at 15 minute intervals;
- field controllers provided with local memory with capacity to locally store 14 days of energy/ metered service data logging (in the event of central hard disk failure);
- provides summary reports (graphical and tabulated) on daily, weekly and monthly timescales;
- provides comparisons to usage from the same time the previous week, month and year;
- generates alerts if unusual usage is recorded, including unusual usage outside Core Hours or usage significantly above the norm for comparable time periods;
- generates alerts if the total of water sub-meters does not sum to the main meter;
- records all alerts in an electronic log;
- stores data for the life of the project (via regular data back-up);
- allows read-only online access by the Directorate; and

- is linked to graphic display screens to provide educational opportunities and information on utility usage to staff, students and visitors. Information must be displayed such that it is accessible to be used for education purposes to allow the building to become a “living textbook”.

The Contractor’s BMS must 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 Directorate.

All mechanical services thermostats, temperature sensors and CO<sub>2</sub> sensors must be connected to a centralised computer based monitoring system which has the following minimum capabilities:

- central controller records the indoor temperatures (for each controlled zone in each building) at 15 minute intervals;
- provides summary reports (graphical and tabulated) on daily, weekly and monthly timescales;
- provides comparisons to readings from the same time the previous week, month and year;
- generates alerts if readings are outside the required bands;
- records all alerts in a log;
- stores data for the life of the project (via regular data back-up); and
- allows read-only online access by the Directorate.

### 8.6.3. Electricity

As a minimum, the Contractor must provide sub-metering in relation to the following items to the technical specifications stated in Section 11 (Electrical Services):

- for buildings over 1000m<sup>2</sup>, separate metering must be provided on a floor-by-floor, building-by-building and space use basis. Separate metering must 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 must be provided for any energy load that contributes over 5% of the total building load, or over 100kW, and to any energy generation system. It is expected that separate meters will be required for the following:
  - each electrical supply to the site, including on site generation such as PV, shall be separately metered and connected to the monitoring system;
  - lighting to each floor/building;
  - all distribution boards. Where distribution boards are split into lighting and power sections, each section shall be metered separately;
  - any heating, ventilation and air conditioning equipment installed;
  - specialist lighting (e.g. gymnasium, stage or auditorium lighting);
  - other central Plant (if applicable);
  - 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;
  - external lighting;
  - lifts (if they are provided as part of the School); and
  - areas utilised as part of Third Party Use.

Exhaust fans (and any reheats) must be metered as part of the Heating Ventilation and Air-Conditioning (HVAC) metering system and must not be connected to power or light meters.

#### 8.6.4. Gas

As a minimum, the Contractor must provide sub-metering in relation to the following items to the technical specifications stated in Section 13 (Hydraulic Services):

- gas supply to each individual building;
- domestic hot water plant;
- other central plant (if applicable);
- home economics / canteen supply; and
- areas utilised as part of Third Party Use.

#### 8.6.5. Water consumption

As a minimum, the Contractor must provide sub-metering in relation to the following items to the technical specifications stated in Section 13 (Hydraulic Services):

- potable water supply to each individual building;
- potable water supply to each floor (where multi-storey construction is used);
- potable water supply to domestic hot water plant;
- potable water supply to any other significant end use;
- 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); and
- areas utilised as part of Third Party Use.

Non-utility meters and sub-meters must meet the requirements of the current Validating Non-Utility Meters for NABERS ratings protocol document issued by the NSW Office of Environmental and Heritage.

#### 8.6.6. Thermal energy

If chilled and/or heating hot water are used to provide temperature control within the buildings, thermal energy meters must 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.

#### 8.6.7. Carbon Dioxide

The Contractor must provide CO<sub>2</sub> sensors for all functional and occupied spaces used as learning spaces in locations representative of the general environment of that space. For example, for mechanically ventilated spaces, the sensor may be located in the extract ductwork. For naturally ventilated spaces, the sensor must be located within the breathing zone at a point furthest from the supply ventilation opening.

The Contractor must integrate the CO<sub>2</sub> sensors with the automated building management system so that active mechanical ventilation and fresh air intake systems can respond to pre-set minimum CO<sub>2</sub> levels by delivering fresh air into the relevant building area. This action will include an automatic balancing operation of related heating or cooling systems if these are operating concurrent with the ventilation response.

#### 8.6.8. Indoor Air quality

Indoor air quality is a function of the generation of air-borne pollutants and their removal or dilution using ventilation.

##### 8.6.8.1. Pollutants

The Contractor must 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 and As-Built:

- paints;
- sealants and adhesives; and
- carpets and flooring.

Engineered wood products must be low formaldehyde in accordance with Green Star Design and As-Built.

The Contractor must implement strategies to avoid or control condensation, high humidity and other unwanted moisture, which could lead to mould growth.

The Contractor must implement strategies to control and remove unavoidable pollutants at their source, such as print areas, cleaners' cupboards, materials technology laboratories, etc.

The Contractor must implement strategies to manage dirt and other pollutants being tracked-in by Users.

### 8.6.8.2. Ventilation

Ventilation must be provided in accordance with AS 1668.2. Refer to Section 10 (Mechanical Services) for additional ventilation requirements.

## 8.7. Heat island effect

Shading of hardstand must be provided to at least 30% of hardstand surfaces, as per the ACT Climate Change Adaptation Strategy (draft). Shade structures adjacent to buildings must be an extension of the building (e.g. covered walkways, extended eaves and verandas). Ample deciduous shade trees are to be a feature of the irrigated grassed areas on the building side of the playground and native trees are to be an extensive feature of the dryland, grassed areas on the outside of the playground.

The Contractor must consider the concrete colour used for paved areas. Care must be taken when large 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 are to be investigated and recommended for approval.

75% of the whole site (in plan view) must comprise of elements that reduce the impact of the heat island effect by meeting any combination of the following items:

- Vegetation;
- Roofing and shade structures that have Solar Reflective Index (SRI) of:
  - Roof pitch <math><15^\circ</math> – a three year SRI >64, or initial SRI >82 where 3 year SRI not available
  - Roof pitch >math>15^\circ</math> – 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;
- Shaded hardscaping using overhanging vegetation, roof structures 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/m<sup>2</sup> GFA of demolition and construction waste is sent to landfill; or
- 90% (by kg/m<sup>3</sup>) of all waste produced during demolition and construction is diverted from landfill.

## 9. Infrastructure

### 9.1. Utility services

All utility services must be sized to meet the demand requirement of the Peak Enrolment numbers, Non-Mandated Community Facilities plus 20% spare capacity for the School.

#### 9.1.1. Water Authority (Icon Water Limited)

The Contractor must:

- 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; and
- 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 must:

- 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 must:

- 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); and
- 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)

The Contractor must:

- 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; and
- 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 (ActewAGL)

The Contractor must provide the following:

- low voltage supply from utility mains via underground conduits to ActewAGL requirements;
- underground conduits for High Voltage (HV) cabling;
- coordination with Utilities regarding the provision and siting of electrical substations; and
- calculation of maximum demand (for the Site) to ActewAGL as the basis for sizing of local electrical substations (where required).

#### 9.1.6. Telecommunications

The School must be connected to the Directorate's "SchoolsNET" network through the ACT Government broadband optical fibre voice and data network (managed by Shared Services). This connection will be the primary telecommunications connection for the school.

A secondary telecommunications connection to the Telstra ADSL network must 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 must be provided in lieu of the Telstra connection.

The Contractor must 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 must install separate lead in conduits to facilitate the future installation of NBN lead-in cable. For the Shared Services connection, the Contractor must comply with the relevant sections of the ACT Shared Services "Technical Specification for Underground Fibre Optic Cabling" (current version). For Telstra or NBN, the Contractor must 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 must ensure that its works are ready and coordinate the on-site works of the two telecommunications providers.

## 10. Mechanical Services

### 10.1. General

The Contractor must design and construct mechanical services (including heating, ventilation, cooling, natural gas, compressed air, extraction systems, etc.) to support the School designs and deliver User comfort and functional areas in accordance with the requirements of the Output Specification.

The Contractor must take account of the possibility that areas within the School may be used outside of Core Hours and design and construct the mechanical services for these areas that support zoned Out of Hours Use. These areas will include the gymnasium, 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 (if provided).

All mechanical services must provide for Peak Enrolment numbers and Non-Mandated Community Facilities.

The design of the mechanical services must take into account the microclimate of the Site, the building form and orientation of spaces, the thermal performance characteristics of the building, the occupancy trends, restrictions on pollutant emissions, occupancy and equipment heat gains. Mechanical services must be coordinated with the ESD strategy for the School and contribute to the efficient use of resources and energy through the Operating Phase. Refer to Section 8 (ESD and Energy Efficiency).

The following issues must be considered for appropriate mechanical systems:

- plant space;
- controls (BMS, facilities staff and user interfaces);
- maintenance;
- energy efficiency;
- noise from mechanical services and its impact on Education Services and administration areas;
- noise from mechanical services and its impact on neighbours and the local community;
- aesthetic appearance (internally and exterior to the building);
- interference with User events;
- response times;
- compatibility with natural ventilation wherever possible;
- effective natural ventilation;
- prevention of unwanted solar heat gain (minimal direct sun on glass in summer and shoulder seasons using external shading, sufficient ventilation openings and thermal mass or additional thermal insulation);
- the provision of air-conditioning or evaporative cooling must not preclude the use of natural ventilation when this can effectively maintain thermal comfort conditions;
- the provision of only natural ventilation must not preclude the future potential addition of air-conditioning or evaporative cooling should the future requirements of a teaching space change;
- the BMS must provide control of mechanical systems, and metering and monitoring in accordance with Section 8.6; and
- the BMS must permit local user temporary over-ride on controlled mechanical ventilation systems (in the event that external circumstances create nuisance to indoor teaching activity spaces).

The provision, operation and maintenance of the mechanical installations must meet the needs of the School as set out in Services Specification.

### 10.1.1. Design day external temperatures

When determining the sizing of any air conditioning, heating or cooling system (including a natural ventilation system). The Contractor must consider at a minimum the impact of both air temperature and solar radiation (except as it applies to the calculation of heating systems).

For air temperature, the Contractor must utilise the Design Day External Temperatures. Design Day External Temperature means the more onerous (meaning colder in winter and hotter in summer) of the parameters listed in Table 6.

**Table 6 –Design Day External Temperature**

	Parameter 1	Parameter 2
<b>Summer</b>		
All Facilities and indoor Functional Areas (with the exception of the BD1)	34.3°C DB / 19.6°C WB	the outdoor design condition (expressed as a temperature) for a representative geographic location in the Australian Institute of Refrigeration, Air-Condition and Heating Design Application 09 (AIRAH DA09).
BD1 room	38.0°C DB / 22.0°C WB	
<b>Winter</b>		
All Facilities and indoor Functional Areas	-2.2degC DB	the outdoor design condition (expressed as a temperature) for a representative geographic location in the Australian Institute of Refrigeration, Air-Condition and Heating Design Application 09 (AIRAH DA09).

In each case in sizing systems for summer, the Contractor must utilise solar radiation data relevant to each site location, as listed in AIRAH DA09.

Plant and equipment providing comfort air conditioning (including services such as power, required by this plant and equipment) must continue operating without shut-down up to an external temperature of 45°C. Comfort air conditioning does not apply to the BD1 space, where continuous availability of air conditioning must be provided at all times.

During operation, the Bureau of Meteorology weather station nearest to the Site will be used as the measure of external temperatures.

### 10.1.2. Design Day Internal Temperatures

The Contractor must achieve the following Design Day Internal Temperatures when external temperatures, measured as set out in Section 10.1.1, are less than or equal to the Design Day External Temperatures set out in Table 6.

**Table 7 Design Day Internal Temperature**

Design Day Internal Temperature	Minimum	Maximum
BD space,	21	24
Physical Education	16	26
Change rooms / showers	18	26
All other areas (subject to Section 8.3 in relation to corridors)	21	26

Design Day Internal Temperature is measured as the dry resultant temperature in each thermal zone or functional and occupied space (whichever is smaller).

When external temperatures exceed the Design Day External Temperature, the Design Day Internal Temperature for the relevant area as set out in Table 6 may exceed the required Design Day Internal Temperature in Table 7 based on the following formula:

- Maximum Permitted Internal Temperature = (Design Day Internal Temperature) + (actual external temperature – Design Day External Temperature).
- The Maximum Permitted Design Day Internal Temperature does not apply to the BD1 space.

### 10.1.3. Temperature sensors

Each thermal zone or functional and occupied space (whichever is smaller), whether conditioned or unconditioned, must have its own temperature sensor that connects to the BMS for the purpose of monitoring temperatures. The temperature sensors must be in representative locations for the zone / space monitored and free from confounding influences such as direct sun, conduction through external walls, local heating or cooling sources etc. These temperature sensors may also be used as part of the data gathering and control system for heating, cooling and mechanical or natural ventilation.

### 10.1.4. Heating

The Contractor must install the most appropriate heating system for a particular application which will depend on the nature of the space to be heated and the activity therein.

Heating systems must be designed to achieve the design day internal temperatures to maintain even temperature within the spaces.

### 10.1.5. Heating system requirements

The Contractor must provide heating systems to comply with the following requirements:

- the systems must be robust and durable;
- ensure that the School can function when minor failures of the system occur;
- the systems must be secure, not complex in operation, flexible enough to achieve multi-functional use including Third Party Use of the School without loss of energy efficiency and the use of complex control and operating systems. Energy consumption associated with zonal out-of-hours use must be minimised within the capacity of the heating system;
- central heating systems with re-circulating air or return-air must not be used in areas where dust, fumes or odours are generated;
- routing of heating or natural gas pipes must be visually satisfactory;
- main heating or natural gas pipes must be routed such that major disruption to the School is avoided as a consequence of minor failures or during routine maintenance;
- access to the piped services for maintenance and repair must be available without major disruption to the building structure. Piped water or gas main service routes must avoid rooms or areas where leaks would disrupt Education Services;
- flexible spaces must have heating equipment capable of being controlled to deliver the required temperature in accordance with Section 10.1.2 (Design day internal temperatures);
- surface temperatures of heat emitters and associated pipework must be safe and not cause injury when coming into contact with exposed skin;
- the winter temperature variation must be less than 2°C within the physically occupied space of room / area volumes;
- excessive vertical temperature gradients must be avoided during the heating season and the temperature 2 metres above floor level must not exceed a 3°C differential from floor level;

- provide zoned systems matched to occupancy areas. These zones must have variable temperature controls to permit Out of Hours Use. Individual thermostatic control must be provided to each room or space;
- space heating controls must be easy to use by untrained school staff, reliable and as far as possible automatic. Adjustable components (thermostats) must be tamper-proof; and
- ceiling mounted radiant panels are not be acceptable in classrooms or offices unless demonstrated not to create uncomfortable conditions for seated occupants.

#### **10.1.6. Energy targets**

The Contractor must install a heating system 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).

#### **10.1.7. Passive solar heating of spaces**

The Contractor must heat spaces not provided with fossil fuel heating (e.g. toilets and enclosed corridors) using passive solar energy and by drawing heated air through the spaces from adjacent occupied spaces.

#### **10.1.8. Ceiling fans**

The Contractor must provide high efficiency ceiling sweep fans to all learning and teaching areas, library open areas, internal open plan collaborative learning areas and in administration and office areas thereby ensuring adequate air movement. The minimum height of the ceiling fans (as measured from the underside of the fan blades) must be 2.4 metres from the finished floor level. Fans in high ceiling spaces must have extended mounting pole, to facilitate air movement around the space.

Ceiling fans must 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 must be provided. They must feature time out controls so that they only operate when required. Push button pre-set control plates are preferred, as spindle / turn knob controllers have not provided durable long term performance in schools.

#### **10.1.9. Fuel source for heating**

The Contractor must as a general rule:

- use natural gas in preference to Liquid Petroleum Gas (LPG) and electricity (with the exclusion of where the Contractor has proposed reverse cycle systems for cooling);
- use natural gas for the heating of Transportable Classrooms; and
- not use LPG when natural gas is available on Site.

#### **10.1.10. Plant and equipment**

The Contractor must comply with the following:

- Plant and FF&E shall contribute to the energy performance requirements set in Section 8 (ESD and Energy Efficiency);
- heating system design is to be based on mitigating the need for personal heating devices;
- inside air must not be used for combustion;
- gas fired Plant must not produce unacceptable nitrous oxide (N<sub>2</sub>O) pollution;
- ensure that the gas fired heating Plant permits N<sub>2</sub>O at a rate no greater than 200mg/kWh of delivered energy;
- high efficiency condensing boilers must be used;

- ensure that centralised Plant is capable of operating only when required to deliver heat. Spaces which will be used for Third Party Use must be separately heated and metered (e.g., gym buildings (and other spaces) at the School will be available for Third Party Use. Mechanical services must be zoned to facilitate such separation and sub-metering provided on all metered services);
- ensure that Plant is not over sized, or inefficient when operating at low capacity; and
- gas Plant must have electronic ignition.

The Contractor must provide the following features to Plant and equipment:

- heat recovery modules in heated areas where there are high ventilation rates; and
- local timer controls linked to a central time controller in the BMS with temperature sensing to avoid overheating.

#### **10.1.11. Centralised Plant versus individual units**

The Contractor must consider the following factors when considering whether to provide centralised Plant or distributed individual units:

- warm up time;
- room occupancy patterns;
- control systems;
- efficiency of systems, particularly in part load circumstances;
- solar gain, especially in north facing rooms; and
- the capacity to effectively support zoning of buildings and use of smaller zones out of hours.

#### **10.1.12. Heating system controls**

The Contractor must comply with the following:

- control systems must have a centralised master clock to ensure after hours switch off as well as local controls allowing variations to suit local conditions;
- the thermostat setting must be adjustable and the thermostat located in an area representative of the general environment the space not affected by direct sun, draughts, proximity to heating or cooling sources; etc.;
- heater controls must be robust, tamperproof and accessible only by staff;
- heating controls must take into account climatic conditions and for centralised and hydronic systems an allowance for early morning warm up to modulate temperature according to space conditions must be included;
- where conditioned spaces have large operable walls and windows in the building external elevation, these must be fitted with a read switch (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; and
- control systems must accommodate power failure and ensure the resetting of the system is a simple procedure.

#### **10.1.13. Cooling**

The minimisation of overheating is integral to the successful utilisation of the School.

The Contractor must 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;

- external shading;
- improved thermal insulation;
- natural ventilation (cross and stack ventilation);
- ceiling fans;
- indoor environment quality;
- thermal mass in spaces;
- diurnal thermal mass storage systems (e.g. mechanically ventilated hollowcore concrete slabs, thermal labyrinth, phase change materials, night sky cooling, rock store, etc.);
- night purge (controlled by BMS and not by manually opening windows); and
- day lighting.

Air conditioning systems must only be considered if the above factors are found to be inadequate in maintaining comfortable room temperatures in accordance with Section 10.1.2 (Design day internal temperatures) (except for locations where provision of air conditioning systems is specifically briefed)).

The Contractor must provide space equipment loads in accordance with the anticipated room use.

#### **10.1.14. Air conditioning**

Where air conditioning systems are provided, the Contractor must ensure the air conditioning system is:

- capable of maintaining operation at external ambient temperature of 5°C above design conditions (cooling mode) and at ambient temperature of 5°C below design conditions (heating mode);
- inverter drive type for non-ducted air-conditioning units;
- not reliant on pumped condensate drains;
- an outdoor unit must 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);
- of a capacity to meet the design load;
- centralised control at the BMS with local override and adjustment on a zoned basis;
- where conditioned spaces have large operable walls and windows in the building external elevation, these must be fitted with a read switch (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; and
- the thermostat setting must be adjustable and the thermostat located in an area representative of the general environment in that space, not affected by direct sun, draughts, proximity to heating or cooling sources; etc.

Air conditioning systems for teaching spaces must not exceed the design speed for more than 20% of the Occupied Hours, averaged over a school year.

#### **10.1.15. BD1 space air conditioning**

The Contractor must provide air conditioning to the School's main ICT Building Distributer Room (BD1). The Contractor must satisfy the following air conditioning requirements by providing:

- a standalone system;
- a wall mounted air-conditioning unit or similar;
- capacity to function 24 hours / 7 days per week, regardless of actual external temperature;
- inverter drive type; and
- outdoor units must 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); and
- of a capacity to meet the design load.

## 10.2. Ventilation

While the majority of the School must be naturally ventilated in accordance with the BCA, areas such as internal toilets, shower rooms, specialist rooms, science rooms fume cupboards, and other areas may require mechanical extraction. Mechanical ventilation must discharge to the outside air. Discharge into roof spaces is not permitted.

The Contractor must provide a 50% improvement on outdoor airflow rate only in occupied mechanically ventilated spaces as detailed in AS 1668.2-1991/2012 and natural ventilation air quantities in accordance with:

- the requirements for chemical and flammable stores as defined in the National Code of Practice – Storage and Handling of Workplace Dangerous Goods;
- ActewAGL relevant requirements and regulations; and
- AIRAH Mechanical Engineering Design Aids.

The location of fresh air intakes must avoid proximity to:

- obnoxious vents and exhausts;
- loading areas; and
- vehicle exhausts, heating exhausts and fume discharges.

Fresh air intakes must be arranged to minimise the risk of air recirculation under prevailing wind conditions.

The Contractor must comply with the following ventilation requirements to achieve the minimum ventilation rates:

- extract rates must be based on litres / sec per person or appliance or canopy velocity. Air changes per hour as a design methodology must be avoided (excluding toilets);
- there must be no need for treated mechanical supply air to toilet areas;
- make up air to all areas must be via natural means assisted if necessary by the extraction system. Permanent vents must be provided independent of the window systems in all areas;
- all 3 Phase extract fans must be operated through variable speed controllers. Toilet exhaust fans or other applicable instances do not require variable speed controllers;
- extract ventilation must be via wall or ceiling grilles. Floor grilles or door transfer grilles must not be used, where make up air is required to rooms, this must be achieved by undercut doors or high level wall transfer grilles;
- systems must be localised with minimum ducting and local exhaust louvres. The extract ducting from one teaching space or habitable room must not route through adjacent teaching spaces and habitable rooms. Any ducting must be formed and installed in a neat manner and where exposed must be aesthetically acceptable;
- in food technology and staff rooms proprietary domestic style canopies with integral fan and grease filters must be provided above each stove or cooktop and demonstration cooktop except in the instance where the capacity of the apparatus exceeds the requirements of AS1668.2 Section 3 and thus must be subject to the requirements there in;
- where possible these canopies must exhaust individually local to the cooker unit. Where this is not possible the exhaust must be via a low-pressure drop quality aluminium sheet or hot dipped galvanized sheet steel duct with suitable speed controlled fan;

- similar proprietary domestic style canopies with integral fan and grease filters units must be provided over stoves or cooktops for kitchenette applications;
- fume cupboards must be provided in accordance with the FF&E Schedule and the Functional Brief. Fume cupboard extraction systems must be provided in accordance with prevailing standards and be integrated with the building design. Fume cupboard extract fans are not to be located in teaching spaces;
- in internal toilet areas if mechanical ventilation is required it must be controlled via the lighting switch with run-on timer. Mechanical ventilation in small internal toilets must be based on Australian Standards. In larger toilet areas ventilation control may be based on presence detection in conjunction with lighting and urinal flushing controls as appropriate and based on 8 air changes per hour or AS1668.2 1991/2012, whichever is the greater;
- ceiling mounted exhaust ventilation must be provided above locations where medium and high capacity photocopiers will be placed;
- in gyms where full natural ventilation is not achievable, ventilation must be by means of simple roof mounted extraction fans; and
- make up air to the changing rooms and toilets in physical education halls must be drawn from the main hall area via high level wall transfer grilles and ducting if necessary.

The Contractor must comply with the following requirements with regard to natural ventilation:

- hand operating mechanisms at low level for high window openings must be provided;
- consideration must be given to the provision of limited areas of higher volume to act as hot air drains and promote the use of natural ventilation;
- where the operation of the natural ventilation system depends on out of hours operation of ventilation openings, those openings must be secure against vermin and unauthorised access;
- consideration must be given to the security of inlet and outlet openings that are required to be left open at night;
- ventilation air speeds must not cause disturbance to normal activities in functional areas; and
- consideration must be given to the alternate summer / winter use of natural ventilation to ensure that winter heating loads are not increased.

Natural ventilation openings must comply with the minimum BCA requirements of free opening area equivalent to at least 5% of the floor area being ventilated (opening locations to promote cross-flow ventilation e.g. on opposite walls and stack-effect ventilation, at low and high level).

### 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 conditions in teaching areas.

Fume extraction systems must be suited to the task, work setting and nature of the fumes 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.

The Contractor must provide the following with regard to dust extraction systems:

- units must be self-contained mechanical clean type, located with regard to acoustic performance, equipment security and serviceability. Each unit must feature:
  - statically and dynamically balanced centrifugal mild steel fan, direct driven by a 415V, 3 phase Totally Enclosed Fan Cooled (TEFC) motor rated to a minimum of IP54 (maximum fan speed 1440 rpm);
  - woven fabric media with abrasive resistant properties, selected for optimal performance with regard to operating cost, collection efficiency and service life;

- acoustic attenuation of the fan assembly and discharge ductwork where necessary (noise levels within occupied areas and externally must be within Section 15 (Acoustic Engineering));
  - electrical driven shaker assembly to clean filter media;
  - bin type dust collector with robust sealing assembly; and
  - explosion relief vent with minimal ductwork and changes in direction to a safe discharge area.
- Where located externally, the dust extraction plant must be contained within a security cage.

Spray booths (where provided in Materials Technology workshops in P-10 schools and Secondary Colleges) must comply with the following requirements:

- The design of the booth and the space containing the booth must comply with all relevant Australian Standards (including AS 4114), 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 to 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 to be fitted with reticulated compressed air; and
- The booth floor and surrounding floor within one metre of the booth entrance must be of impervious non-combustible material.

#### 10.4. Natural gas

The Contractor must 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 the mechanical heating plant, domestic hot water plant, heating and cooking appliances, catering equipment and teaching labs, workshops etc.;
- the gas distribution pipe work must be arranged, so that there is one single entry point for the building directly fitted with a pressure proving system. From this point distribution pipes must be routed (in compliance with the ventilation requirements) within the building to the various areas;
- each teaching space supplied with gas (for purposes other than heating) must 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 must include a manual reset key switch system, and must 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 must be key operated only and isolation of the system must be student tamperproof. The test mode operation must operate via the key system and must not require the operator to maintain pressure on a test button. The maximum test time of each system must be 35 seconds;
- include provision for natural gas connections for future Transportable Classrooms in accordance with the master development plan for the School;
- isolation valves must be provided to permit isolation and servicing of rooms and spaces containing gas fired appliances or equipment;
- gas booster devices must not be used; and
- all underground piping must be adequately protected from damage from vehicular traffic.

### 10.5. Ductwork and air distribution

The Contractor must provide ductwork system design based on design parameters relating to pressure drop and velocity ranges recommended in the ASHRAE Guidelines and as required to help achieve the overall energy performance requirements set in Section 8 (ESD and Energy Efficiency).

### 10.6. Pipework reticulation systems

The Contractor must provide a pipework system based on design parameters relating to pressure drop and velocity ranges listed in the AIRAH Technical Handbook.

Systems must be industry standard and fit-for-purpose and must include isolation and balancing valves at each branch take-off and at each floor (where a multi-storey design is proposed).

### 10.7. Noise and vibration

For specific building services acoustic design criteria refer to Section 15 (Acoustic Engineering).

### 10.8. Refrigerants

All Plant items using refrigerants must be selected for zero ozone depleting and low hydrocarbon global warming potential.

### 10.9. Mechanical services spare allowance

The Contractor must provide the following allowances for future expansion within the School:

**Table 8 – Mechanical services allowance**

System	Sub-division	Allowance for spare capacity
Boiler Plant	Installed capacity	20% spare capacity on Peak Enrolment student numbers
	Spatials	20% spare capacity on Peak Enrolment student numbers
	Configuration	20% spare capacity on Peak Enrolment student numbers
Heating Water Piping	Install capacity	20% spare capacity on Peak Enrolment student numbers
Pumping	Heating hot water configuration	Dedicated pump per boiler.
	Pump capacity	20% spare capacity on Peak Enrolment student numbers
Piping Racks	Spatial allowances	20% spare capacity on Peak Enrolment student numbers
Natural Gas Supply	Capacity	20% spare capacity on Peak Enrolment student numbers
	Piping	20% spare capacity on Peak Enrolment student numbers
Fans	Capacity	20% spare capacity on Peak Enrolment student numbers

### **10.10. Mechanical services design outputs**

The Contractor's design for Mechanical Services must include an illustrated User Guide that provides clear and easily understood guidance on all user adjustable mechanical systems, including:

- Table of contents;
- Manufacturer, model, configuration and features of the product;
- On/off controls and user adjustments and controllability;
- User guidance and instructions;
- Maintenance and spares; and
- Simple troubleshooting.

Where appropriate, the Contractor may include user instructions published by equipment and systems manufacturers.

The user guide is to be provided in 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.

## 11. Electrical Services

### 11.1. Design Criteria

The electrical services must also be in accordance with the relevant sections of current Australian Standards, and ActewAGL regulations and requirements.

### 11.2. General

The electrical services installation must comprise electrical supply, main switchboard(s), power distribution services, lighting services, infrastructure services, earthing and protective services.

The Contractor must take account the possibility that areas within the School will be used outside of Core Hours and design and construct accordingly for these areas and include for the provision of separate metering facilities. These areas will include the gymnasium, general learning and teaching areas, library/ learning resource centre, administration areas, specialist rooms and ancillary areas and associated corridors.

The design of the electrical services must take into account the building form, the characteristics of the building, the occupancy trends and orientation of spaces.

The design, construction and operation of the electrical supply installations must meet the needs of the School as set out in Functional Brief.

### 11.3. Incoming supply and electrical substations

The supply to the School must be taken from the utility electrical network via a transformer located adjacent to or on the Site. The incoming supply must be trenched underground in a location that it is outside areas identified for future expansion on the Site.

A sub-station must be located as a stand-alone proprietary unit near the Site boundary and not as an integral part of the School. The sub-station must be designed and installed in accordance with the supply Authority requirements.

The Contractor must provide incoming supply and electrical substations in accordance with the following requirements:

- a full design load based on estimated load for Peak Enrolment numbers Facilities;
- sub-station(s) must be located in strategic locations in relation to the new and future loads to minimise the energy transmission losses;
- electrical supply parameters must be in accordance with the relevant supply Authority regulations and requirements but generally 400/230V +10%/-6%;
- incoming high voltage switchroom and high voltage (HV) cable route requirements must be in accordance with supply Authority requirements;
- maximum total harmonics distortion acceptable for the installation must not exceed 5% (THDi); and
- incoming mains from sub-station to main switchboard must be sized to the full rated output of the transformers.

### 11.4. Supply Authority metering

Statutory supply Authority metering at the low voltage entry into the Site must be provided in a location in accordance with the relevant supply Authority.

### 11.5. Main switchboards

The electrical main switchboard must be housed in a dedicated room or cupboard located on the ground floor in association with an external wall. The main electrical switchboard must not be placed in the BD spaces, or in functional storage spaces. The space must be located so that it does not present difficulties for services

distribution from adjoining plant spaces or rooms and must be located so as to provide for economic distribution of services.

The main switchboard must be of a metal clad cubicle design to approved regulations and Australian Standards. Provision must be made so that any electric field generated at the main switchboard does not leak to adjacent spaces or cause interference to School 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.

Each switchgear assembly must have a minimum 25% spare capacity, over and above that required for peak student enrolment numbers. Electronic surge protection must be provided on incoming mains.

Main switchboards and sectional switchboards must be appropriate in terms of all electrical and mechanical criteria. Main switchrooms must be two (2) hour fire rated construction and contain smoke detectors (no sprinklers).

The Contractor must provide the following with regard to the provision of main switchboards:

- all main switchboards must be a minimum of Form 3B type;
- the main switchboard must be sized to the full rated capacity of transformers;
- load arranged to suit the different load types within the School;
- type test certificate must be provided for each form rating;
- full discrimination curves must be provided from the supply Authority protective device to the final sub-circuit protection;
- full sized neutral and earth bars must be provided in all compartments;
- neutral bars must be located within the same compartment as the active bars;
- energy meters must be located as stated in Section 8 (ESD and Energy Efficiency);
- energy meters must be digital multi-functional meters (discrete meters are not to be used);
- energy meters must be connected to an BMS energy management / monitoring system as stated in Section 8 (ESD and Energy Efficiency);
- each low voltage main switchboard must be fitted with an energy meter;
- each main switchboard must be separated from an adjoining switchboard;
- all busbars passing through insulation barriers must be provided with a secondary layer of insulation on the busbars;
- main switchboard must be located in the room to allow 1m switchboard extensions at each end;
- main switchboards must be modular design;
- spares (at 10% of the installed provision) must be provided to each circuit breaker protective fuse and light indicator type within the Main Switchboard (MSB) enclosure;
- laminated site distribution schematics, and main switchboard schematics, must be installed on the switchroom wall;
- all escutcheon panels must be hinged;
- all localised energy metering must be provided and monitored by the energy management / monitoring system;
- all main switch positions must be provided and monitored;
- all equipment must be identified by durable permanently fixed labels (Traffolyte or similar), clearly marked details of the equipment's function and designation;
- switchgear must be capable of being padlocked in the off position;

- all panels on the switchboard must be via lift off hinges or knurled or crowned nuts, to enable ready removal by inspection; where provided, all critical air circuit breaker (ACB) main switches must be capable of being removed / replaced whilst the load is being supported by an alternative source; and
- power factor correction must be consistent with best practice energy conservation aims throughout the Operating Phase.

### 11.6. Distribution boards

The Contractor must provide the following with regard to the provision of main switchboards:

- all floor distributor switchboards must be Form 2 when the main isolator is rated at, or greater, than 200 Amps;
- all floor distribution switchboards must be Form 1 when the main isolator is rated less than 200 Amps;
- distribution boards must be split into power and lighting sections, except where serving small or individual functional areas;
- each distribution switchboard must have a digital electronic energy meter connected to a central monitoring system;
- distribution boards must be sized to support forecast building user power demand unless the distribution board is designed to also support additional demand from Transportable Classrooms necessary to satisfy the School's Peak Enrolment. In either case, distribution boards must be provided with 35% spare capacity over forecast demand (10% spare fitted, 25% spare);
- all outgoing circuits from the distribution switchboards must have circuit breakers (minor control circuits can be fuses);
- the fault current must be calculated and appropriately rated circuit breakers selected;
- distribution boards must be located in appropriately sized secure cupboards, within each building or compartment served. They must not protrude into circulation spaces, and must be complete with lockable door over;
- distribution boards must typically be accessible from common areas or circulation spaces;
- distribution boards must not require access from within offices or teaching spaces;
- no other services are to be located in or cross over the electrical distribution board cupboards;
- all switchboards must be provided with a lockable door covering all control and protection devices with hinged escutcheon cover;
- distribution boards must be located within the building being served with separate distribution boards provided for each building;
- separate specialised load equipment must be served by their own dedicated distribution boards (canteens, food technology, materials technology);
- all distribution boards must be provided with separate enclosed chassis for alternative load types;
- the minimum circuit breaker bus bar rating must be 250 Amps;
- the minimum fault interrupting capacity must be 6 kA;
- all distribution and mechanical switchboards must be labelled with the incoming submain number, rating of the circuit protective devices and the size of the incoming submains;
- inside each distribution board door, an accurate circuit schedule must be housed within a proprietary holder and securely fixed. Related lighting and power plans must also be housed within the distribution board;
- a label must be provided on the switchboard door indicating MSB numbers, main circuit breaker size, cable size, approximate length, and cable description of submain;

- all labelling must be Traffolyte, securely fixed to the doors (sticky labels are not acceptable);
- localised surge protection must be provided at each distribution switchboard;
- all switchgear from and including the MSB to the final circuit protection must be of common manufacture supply for ease of maintenance and adequacy for circuit discrimination;
- the loads on the distribution switchboards must be balanced as evenly as possible;
- dog tags must be provided on critical circuits which are not to be accidentally turned off;
- dedicated computer rooms must have a distribution panel in each room, dedicated to that room only;
- in dedicated computer rooms, no more than four stations (twelve sockets) must 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; and
- all data communications rooms must have a dedicated distribution panel.

### 11.7. Power factor correction

Project Co must provide the following with regard to power factor correction:

- provided on all main switchboards covering all load groups;
- minimum power factor of 0.98 lagging must be in accordance with relevant supply Authority requirements;
- located in the main switch room;
- must connect power in 25% (maximum) steps and be fully automatic;
- provide tap changes, capacitors, inductors, etc.;
- accommodate the full load current of the component connected;
- be modular in design;
- use standard stepped components;
- incorporate multi-functional digital meters;
- be a separate enclosure to main switchboard; and
- implemented to avoid resonance in the design.

### 11.8. Check and energy metering

The Contractor must 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 must provide volt, amp, MD pF, V and I harmonic distortion and kWh functions;
- energy monitoring /management system software must be configured to provide results on a monthly basis to an agreed format; all meters must comply with AS 1024 for accuracy Class 1;
- accuracy shall be  $\pm 1\%$  over 20 to 105% working range;
- current transformer metering must be provided for all loads in excess of 100 Amps;

- all current transformer units and protection devices must be readily removable for maintenance;
- all meters must provide data at a maximum of 15 minute intervals;
- energy monitoring /management system software must be configured to provide results on a monthly basis to an agreed format; and
- meters must be provided with a high level interface and connected to the BMS / Monitoring System.

The Contractor must refer to Section 8 (ESD and Energy Efficiency) for a full extent of metering requirements.

### 11.9. Underground pits and duct system

The Contractor must 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 must 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 must be sufficient for Peak Enrolment demand, plus 25% spare capacity to accommodate future growth;
- all conduit joins must 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 must be installed under the slab, directly to the main switchboard or distribution board they are supplying;
- the conduit system must link to all buildings;
- the conduit must be marked “Power Cabling” along the length of the conduit;
- all conduit sections must have a minimum of two draw ropes, installed within the conduit;
- only pre-manufactured bends must be used. 90° bends must not be used;
- a pit must be provided for each change in direction of greater than 45°;
- a minimum of one pit every 50m must 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 must be such that the lock is vandal proof and not allow the dropping of debris into the pit;
- all underground pits must be of the heavy duty and trafficable type (minimum);
- all underground conduits to be clearly identified above ground with acceptable cable markers; and
- an underground pit and conduit system must be provided to the initial and future locations of modular and transportable buildings. A pit must be provided proximate to the location of each transportable building, with a conduit route back to the main switchroom or a designated distribution board that has been sized for future connection of these transportable buildings .

### 11.10. Cable reticulation

The distribution system between the main switchboard and distribution boards must 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 must be used to carry electrical distribution cables or final sub-circuit cabling.

The Contractor must 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 must 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 must be a maximum of 5%. The design must 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 must 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 must indicate the circuit protection device capacity and rating. Circuit breakers must contain adjustable current capacity;
- positioned to avoid crosstalk to other cabling systems;
- high capacity power cables must be located and configured to avoid emitting high levels of electromagnetic interference;
- sub-main distribution systems must use copper only conductors. Aluminium conductors must not be used;
- an electrical earthing bar must be provided adjacent to each main switchboard;
- minimum sized lighting sub circuit 16A with a minimum cable size of 2.5mm<sup>2</sup>;
- minimum sized power sub circuit 20A with a minimum cable size of 2.5mm<sup>2</sup>;
- all outgoing sub-mains must 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 must be provided for lighting circuits;
- black TPS cables must be provided for power circuits;
- all cabling systems must be fully supported over the cable route length via either cable ladders, ladder tray and/or catenaries. Cable ladders and trays must 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 must 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 must be mechanically protected; and
- all cabling types must 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.

### 11.11. Permanently connected equipment

The Contractor must provide isolating switches for each item of permanently connected equipment. Isolating switches must be:

- rated at not less than the circuit protective device;
- mounted adjacent to each item of equipment; and
- flush mounted for internal installations and surface mounted weatherproof for external installations.

## 11.12. Power circuits

The Contractor must 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, WAPs, 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;
- appliances and powered equipment as detailed in the Functional Brief, Furniture, Fittings and Equipment Specification and FF&E Schedule; and
- cleaning and maintenance purposes.

The Contractor must 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 must 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 must 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 must be mounted on wall mounted multiple compartment cable ducting, or ceiling suspended outlets, or on benchtop mounted pedestals. This must be noted on all drawings;
- power outlets must be provided in each teaching space. The Contractor must provide sufficient power outlets, mounted 300mm above the finished floor level or 150mm above benchtops;
- in the pre-school, all power outlets must be protected with a safety mechanism or located at least 1500mm above floor level;
- power outlets within P-6, P-10 and Secondary College teaching spaces and Learning Communities shall incorporate USB charging outlets;
- power and data outlets for ceiling or wall mounted equipment such as data projectors, must be coordinated with the location of the device;
- power outlets and associated services in the physical education halls must 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 must be suitably rated and switched with neon indicators. Seven day timers must be provided in these areas to eliminate standing losses out of Core Hours;
- electric hot air hand dryers must 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 must be supplied on a separate circuit;

- all outlets must be suitable for the intended use, and consideration of the use of outlets by students must be given.;
- all cleaners outlets must be installed on a separate circuit; and
- all fume cupboards must incorporate a double power outlet on the external top or side of the unit.

The style of internal switchplates, power outlets and data outlets must be consistent across all spaces. Internal switchplates, power outlets and data outlets must not have cover plates or escutcheon plates that can be snapped off.

Every power and data wall plate must be permanently marked with either the power circuit or the data port/ cable number(s). Where labels are adhesive fixed, the adhesive must form a permanent bond between label and plate.

Provision must be made on local Distribution Boards (DBs) for isolation of external power outlets.

For a summary of minimum power provision requirements see Table 9 below.

**Table 9 – 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 must 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

Space/ Room or Functional Area	General provision of electrical outlets (minimum applicable to each separate space)
	power shut-down buttons per space.
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).
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	<p>Three double power outlets to three walls, and one additional power outlet (distributed around perimeter walls) for each item of powered equipment (refer FF&amp;E Schedule). Four double power outlets per instrument rehearsal room.</p> <p>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.</p>
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 store rooms	One double power outlet – located clear of fixed storage joinery and fittings.
BD1 space	<p>Power as required for all active equipment, plus two double power outlets wall mounted above the work bench.</p> <p>Provision of power to BD Cabinets will include the provision of Captive Outlets managed by Circuit Breakers at the building DB. These circuits will be Traffolyte-labelled at the BD Captive Outlet and DB as "Caution: Circuit Breaker". The Captive Outlets are to be installed inside the BD Cabinet at no less than 700mm from the Cabinet finished floor level.</p>
BD"x" space	For every other BD space, power provision is required as for all active equipment, as for BD1 space, but omitting power outlets for a work bench.
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 kitchenett	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	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	At least one weather resistant external grade power outlet to each elevation of each building – located proximate to outdoor sports fields, outdoor performance and assembly areas. Provide one weather resistant external grade power outlet to each external learning/ project area outside Art and STEM spaces. One weather resistant external grade power outlet at the external area of the staff lounge.
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.
Plant rooms	One power and data set in addition to any power requirements required for plant and equipment

### 11.13. Electric Hand Dryers

Project Co must provide hand dryers suitable for a 240 Volt, 50 Hz supply. The noise rating must be less than 65 dB(A) at 1 meter. Assemblies must be complete with concealed mounting hardware to suit the wall type. The unit shall be mounted on vibration insulating rubber. The air nozzle must 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 must be incorporated, alternatively, an automatic sensing type may be offered.

### 11.14. Power emergency stop

The Contractor must 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 must trip off all power circuits within the respective room / laboratory. The power shutdown button must be of the 'latched on' type and require unlatching after use.

For science laboratories and food technology areas, the emergency stop button must 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).

### 11.15. Lightning Protection

A lightning protection system must be provided to protect:

- the occupants;
- electrically operated plant and equipment, appliances, ICT and AV devices and the like; and
- the building itself.

### 11.16. Earthing systems

The Contractor must provide the following with regard to earthing systems:

- separate Low Voltage (LV) earthing systems must be employed and cross coupling of these must be subject to the agreement of the relevant energy Authority;
- separate earthing conductors must be provided with all sub-mains and sub circuits;
- earth impedance must be provided with test results provided on completion;
- the earthing system must provide the ability to connect additional 20%, over and above that required for Peak Enrolment numbers, earthing medium anywhere in the network;
- all metallic wall framing systems, supporting General Power Outlets (GPOs) or electrical cabling must be bonded to the electrical earth system to provide equipotential bonded to earth;
- all electrical cable support systems must be electrically earthed;
- a communications earthing system associated with the data block cabling system must be provided; and
- the reference earth bar must be pre-drilled to accommodate outgoing cabling.

### 11.17. Lighting systems

The Contractor must satisfy the following specification with regard to lighting:

- luminaires must be sourced from proven production runs with demonstrated performance levels, of good quality and easily maintained. All areas including plant rooms must be supplied with artificial lighting;
- the lighting design consideration must also be based on an optical system to suit the environment where the luminaire is installed and maintain the performance of the luminaire throughout its life;
- luminaire selections must be appropriate to the environment and conditions of their locations. External luminaires must be weather and insect resistant. Internal luminaires in high moisture environments must be water resistant;
- the specific lighting must suit the task being performed and must control luminaire glare;
- the lighting and general appearance of the luminaires must suit the space illuminated;
- all fluorescent luminaires must incorporate low loss ballasts;
- the lighting design must contribute to achieving the overall energy performance requirements set in Section 8 (ESD and Energy Efficiency);
- custom made luminaires must be avoided;
- luminaire locations requiring access machinery are to be avoided;
- standardisation and minimisation of lamp types is preferred;

- all external luminaires must be vandal resistant and appropriately IP54 rated;
- daylight control devices must reduce artificial illumination when daylight is present;
- controls and switches must be of robust construction;
- motion / occupancy sensors must 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;
- mercury vapour, sodium vapour and incandescent lamps must not to be used, internally within buildings;
- electronic control gear incorporating high frequency ballasts must be used in preference to iron core devices;
- lamp selection must be based upon best available energy performance to suit the application, with efficient lumen output and lumen maintenance considered;
- LED lighting is required in all locations (unless otherwise approved by the Territory);
- luminaires enabled with distributed intelligence and the capacity to communicate with adjacent luminaires are to be considered;
- tungsten and incandescent lamps must not be used;
- linear luminaires in general learning and teaching areas, circulation areas and science rooms must be of the prismatic diffuser type;
- feature lighting for notice boards, display cabinets and other specialist display areas must be provided in accordance with the design;
- shower areas must be provided with appropriate lighting outside of the shower cubicle. i.e. in the common circulation space;
- luminaires must have an Ingress Protection (IP) rating appropriate for the installation location;
- suspended luminaires must 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) must be protected from impact damage;
- internal security lighting must 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 must be provided to ensure safe access. The lighting of pathways, carparks, and roads within the Site must be provided by the Contractor as a minimum to allow security illumination and the safe passage of all Users;
- car park lighting must be in the form of high level post mounted luminaires or luminaires attached at high level to walls of buildings facing onto the carpark; and
- lighting spill from external lights must be modelled and contained to prevent nuisance to neighbours.

**Table 10 – 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 Play Rooms and quiet activities areas	240	D
Toilets – staff, toilets – students, change/shower – staff, change/shower –	240	

students, security store, store rooms		
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 work spaces, Building Distributor Cabinet No.1, 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	240	
Toilets – staff, toilets – students, change/shower – staff, change/shower – students, security store, store rooms	240	
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 work spaces, Building Distributor Cabinet No.1, ICT technician's room, canteen	320	
Design spaces, science spaces, technology spaces, art, music, library	320	
Drama	320	D
Fume cupboard interiors	400	
First aid room	240	D

### 11.17.1. Natural daylight

The Contractor must comply with the natural daylight requirements noted in Section 8.4.

### 11.17.2. Lighting switching systems

The Contractor must 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 must:

- 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 preset 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 must 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 must 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 must not be able to be 'pushed in' from the front of the switch;
- lighting switches to any disabled access toilet must 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 over rides for external lighting; and
- be controlled to provide dimmable function where specified in the Functional Brief.

### 11.17.3. Emergency and exit lighting

Emergency lighting must 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 must satisfy the following specification with regard to emergency and exit lighting:

- luminaries must be sourced from proven production runs with demonstrated performance levels;
- the system must contain either a cabled or wireless communication network;
- the system must incorporate central monitoring and testing facilities;
- be attractive in appearance to suit the ambience;
- the system must be capable of accommodating additional luminaries anywhere within the systems network;
- non-maintained tubes for the emergency lighting function are preferred;
- emergency and exit luminaries must contain a localised battery source of a minimum 10 year life;
- battery and control circuitry must be modular in design to enable quick replacement techniques;
- exit signs must contain 'low energy' lamp sources comprising cold cathodes or LED sources; and
- the system must be designed to enable alterations and additions at any point in the network.

### 11.18. Clock installation

The Contractor must provide clocks to the School that are:

- fitted with an analogue face of nominal 240mm diameter, with a continuous sweep second hand;
- 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 the 'master' clock; and
- each connected to a 230 volt supply via a clock point.

The 'master' clock must be located in the administration office. Repeater clocks must 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 sports hall, the canteen, and externally where specified in the Functional Brief. A protective cage must be installed over the clock in the gymnasium sports hall.

### 11.19. Photovoltaic (PV) Systems

The ESD requirements include the installation of on-site renewable energy generation, with a preference for PV. The Contractor must comply the following with regard to any PV installations:

- ensure all cable loops are minimised to reduce the effects of induction;
- all DC cabling must be double insulated. DC cabling must 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 must 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 must be designed to provide peak load lopping capability. It must 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 and Control System (BMCS);
- Inverters must be located and secured to prevent easy access by unqualified people (e.g. staff and students);
- the total photovoltaic electrical system from the DC terminals of the photovoltaic panel to AC output of the photovoltaic array must be a minimum of 85% overall efficient. This must include all cable, inverter, diodes and termination losses; and
- all solar panels must have electrical module efficiency of minimum 15%.

The PV panels power output must be provided with minimum manufacturer guarantee of:

- 90% of nominal power after 12 years; and
- 80% of nominal power after 25 years.

### 11.20. Additional electrical service requirements

The Contractor must 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 11 – Additional Electrical Service Requirements**

System	Sub-division	Allowance for spare capacity
Substations	Capacity	25% spare
	Spatials	50% spare
Main switchboards	Capacity	25% spare; 10% equipped
	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
		35% total
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 must provide one single structured integrated cabling system (and associated infrastructure). The system must satisfy the ICT requirements associated with the Functional Brief (Volume 2, Part A) and the FF&E detailed in Volume 2, Part D and must 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 must allow for economical expansion as the School expands and develops should additional buildings be constructed in the future.

The design of the ICT infrastructure must be integrated into the overall building design, and must support data, voice, security and building monitoring and control systems.

The Contractor must liaise with Shared Services ICT for the preferred location of the lead in conduits for the SchoolsNET connection, and with the relevant telecommunications service providers (for the Contractor-managed Building Services Network (BSN)) for the preferred location of the lead-in conduits from the Site boundary to the campus distributor.

The Contractor must 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 *Technical Specification for Underground Fibre Optic Cabling*.

All cabling must be the highest ratified cabling standard available at the time of installation (including, as a minimum, Cat 6A and 12 core OM4 grade optical fibre cable).

The scope of the term 'communications systems' may be dependent upon the particular design solution proposed, but as a minimum the Contractor must:

- provide a layout design, incoming cable pathways and structured cabling work to support a Voice over Internet Protocol (VoIP) telephone system. 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 and telecommunications services across the site in accordance with the system design and requirements of the Functional Brief; and
- provide the passive infrastructure to support a data Local Area Network (LAN) for SchoolsNET and for the Contractor's network.

The Contractor is not required to procure the internet service or provide the active equipment for the SchoolsNET network.

The Contractor must ensure that all structured cabling work is undertaken by approved cabling contractors listed on the ACT ICT Cabling Contractor panel (current version at the time of use of this Specification).

The Contractor must 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 cabling design and installation must comply with Shared Services ICT's *Technical Specification for Building Cabling (Structured Cabling Systems) for ACT Government Directorates* and *Technical Specification for Underground Fibre Optic Cabling*, all relevant Australian Standards and any other regulations of the relevant Authorities having jurisdiction over such works.

### 12.1.2. System resilience

The Contractor must provide one or more Uninterruptable Power Supply units (UPS) to support systems on its Contractor-managed Building Services Network (BSN) that are critical to the safety and security of users and occupants, that would otherwise fail in the event of an interruption to mains power supply (e.g.: the public address system, door security and electronic locking systems (if used)). The UPS units must be located in the Contractor's communications rack in the shared BD spaces.

Minimum UPS support time period to be 30 minutes (under full load).

### 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 switches and Wireless Access Points (WAPs) associated with the School, with the exception of any active data equipment associated with any building management or monitoring system installed by the Contractor and other active data equipment expressly excluded or noted as a the Contractor responsibility in the Technical Specification (Volume 2, Part C).

The Territory (through Shared Services ICT) will procure install and commission all active data equipment associated with the School, excluding WAPs. WAPs are to be cabled, and installed by the Contractor.

The Contractor must supply, install and commission any active data equipment associated with the building management and monitoring systems installed in the School and all active data equipment associated with any systems or technologies proposed by the Contractor for the operation and management of the Facility.

### 12.1.5. Services distribution

The Contractor must provide a structured cabling system (and associated infrastructure) that consists of a main Distribution Frame, Campus Distributor, Building Distributor and Floor Distributor (if multi-storey construction is used), horizontal cabling and data outlets. The structured cabling system must comply with Shared Services ICT's *Technical Specification for Building Cabling (Structured Cabling Systems) for ACT Government Directorates* and *Technical Specification for Underground Fibre Optic Cabling*.

The Contractor must provide backbone redundancy via extra capacity and alternative pathways and all reasonable single points of failure must be mitigated.

The Contractor must provide telecommunications infrastructure to all permanent and modular or relocatable buildings within the Site.

The Campus Distributor must incorporate the local Building Distributor and the Main Distribution Frame.

The Contractor must provide:

- optical fibre cabling between the Campus Distributor and the Building Distributors;
- optical fibre cabling between the Building Distributor and the Floor Distributors;
- optic fibre between building distributors and pits servicing Modular relocatable buildings and future Transportable buildings;
- Unshielded Twisted Pair (UTP) between buildings if required to support the Contractor-managed Building Services Network (BSN), BMS monitoring, metering signals or similar functions (noting that UTP to be laid in separate labelled conduit to differentiate copper pathway from optic fibre pathway); and
- horizontal cabling and data outlets.

The distribution system must be:

- sized and designed to accommodate the number and the proposed locations of the Transportable Classrooms necessary to satisfy the School's Peak Enrolment; and

- 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 must provide:

- structured cabling from distribution points to data outlets. The Contractor must provide and distribute data outlets to support the requirements detailed in the Functional Brief (Volume 2, Part A) and the FF&E detailed in Volume 2, Part D (Furniture, Fittings and Equipment Specification). This must include data outlets associated with networked devices including, but not limited to, computers, WAPs, Interactive Teaching Technology (ITT) devices (Interactive Flat Panels, Interactive White Boards (for P-3 year levels), etc.), wall mounted ultra-short throw projectors, audio visual RGB projectors, display screens, printers, etc.; and
- cable pathways in the floor, wall or ceiling in each classroom and teaching space. Cable pathways must be designed and installed to allow for the installation of additional data outlets in the future.

Data outlets must be correctly IP rated and damage resistant for their installed area and application. The telecommunication outlets must be fit for purpose and at an appropriate height for the users of the room.

Typically, data outlets must be installed 300mm above the finished floor level or 150mm above a fixed benchtop. Outlets dedicated to specific equipment or functions, including VoIP handsets, must be located in positions suitable for their intended purpose.

The numbering and labelling scheme of the data outlets must be agreed with the Territory two months prior to the Contractor commencing the installation of the cabling and outlets. All data outlets must be permanently labelled with Traffolyte labels or equivalent.

The horizontal cabling links must not exceed 90 metres at any point.

All data outlets must 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.

### 12.1.7. Pits and duct system

The Contractor must provide a pit and conduit system to SSICT specifications between all buildings and the proposed locations of the Transportable Classrooms. The system must 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 must be cast under the slab and routed directly to the equipment rack or frame that they are to supply.

The Contractor must coordinate with Shared Services ICT for the installation of a lead-in pathway from the property boundary to the Main Distribution Frame. The pathway must be used for incoming voice and data services and must be sized accordingly. The Main Distribution Frame must be located within the Campus Distributor.

The Contractor must provide an in-ground pit and conduit system to the proposed locations of the Transportable buildings. A pit must 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 must 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; and

- BD cabinets, patch panels, Fibre Optic break-out tray.

Patch panels must match the rating of the twisted pair structured cabling, with each patch panel having a minimum of 24 ports and a maximum of 32 ports. The same patch panel models must be consistently used in all BD cabinets.

Access to each BD cabinet must be from the secure interior of its building. BD cabinets must be finished with seamless vinyl floor, painted plaster walls and ceiling, and lockable doors with dust seals. Ceiling height must be minimum 2700mm. Each BD cabinet must be secure, well insulated and have no direct natural light sources.

Cable risers from BD cabinets to ceiling level must be neatly contained in metal cable ducting with a removable cover.

BD cabinet spaces must not contain:

- Any hydraulic services (sinks, taps, drains, sumps, water heaters, vents, condensate drains or the like); or
- Storage not specifically related to ICT and Comms requirements.

### 12.2.1. Building Distributor 1(BD1)

Building Distributor Cabinet No.1 must be designed in accordance with relevant sections of the Shared Services ICT specifications. The location chosen for the BD1 must take environmental and security conditions into consideration. BD1 must be designed to provide space for and access to:

- (a minimum of) 2 restricted class 45RU cabinets for Shared Services ICT use (each minimum size 800mm x 800mm) arranged side by side, bolted together and with the adjoining sides removed. One cabinet will be configured to manage optical fibre services (including the fibre lead-in service). The second cabinet will be configured to manage copper services.
- the Contractor's cabinet(s) for communications and active equipment associated with the Contractor's systems and network connection including Electronic Security, Building Management System, Clock Controller, UPS.
- Boards or frames for associated active equipment.

The Campus Distributor and Main Distribution Frame must be sized to accommodate the active data equipment associated with the School including the Transportable Classrooms necessary to satisfy the School's Peak Enrolment.

BD1 must also accommodate the incoming services equipment and building management /security management active equipment/ control panels.

The Contractor must provide a separate communications rack to house active data equipment associated with the BMS installed by the Contractor. The Contractor must 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 must 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 the carrier's staff to work on the equipment in accordance with health and safety guidelines.

The room must 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, must be provided by the Contractor.

Access to the front and rear of all racks is required.

### 12.2.2. Building / Floor Distributor Spaces

The Contractor must provide dedicated telecommunication rooms or telecommunication spaces for Building Distributors and Floor Distributors. The spaces must 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 must provide a Building Distributor (BD) cabinet for each separate building on the Site. Where a building has more than one floor, additional Floor Distributor's must be provided. Where telecommunication outlets for a floor/area cannot be served from the Building Distributor or Flooring Distributor, an additional Floor Distributor must be provided.

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 and all wall mounted swing racks must be concealed.

Access to the front and rear of all racks is required.

### 12.2.3. Equipment racks

Equipment racks will be located in the BD1 and in sequentially numbered Building Distributor (BD) spaces located in other buildings. The Contractor must provide all equipment racks that must meet the following minimum requirements:

- Restricted Class cabinets bolted to the floor;
- minimum 27RU provision for active equipment plus 12RU space for installation of a UPS, plus minimum spare (vacant) capacity of 5RU;
- minimum dimensions 800mm wide x 800mm deep;
- 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; and
- Traffolyte labelled with an identification number (in the format  $BDn-x$ , where  $n$  denotes the BD Cabinet, and  $x$  denotes the number of each rack in that cabinet).

Equipment racks must be sized to accommodate the ICT requirements of Transportable buildings required to satisfy the School's Peak Enrolment.

The Territory must have access to all equipment racks at all times.

### 12.2.4. Patch leads and fly leads

The Contractor must provide:

- two off patch/fly leads for every telecommunication outlet installed; and
- two off optical fibre patch lead for every optical fibre trunk installed and terminated.

The patch/fly leads must be of the same category as the structured cabling.

The Contractor must provide patch panels, minimum of 1.5 ports per data outlet.

The lengths and colour scheme of patch leads must be agreed with the Territory two months prior to the Contractor commencing the installation of the cabling and outlets.

## 12.3. Wireless networking

The Contractor must design the layout of Wireless Access Points (WAP) so that site-wide wireless networking is provided with the density of coverage being capable of supporting a maximum of 25 people per WAP without gaps in coverage. Designed locations must incorporate outdoor areas in addition to the buildings to ensure all outdoor learning areas including the Central Plaza and all outdoor areas within a 20m radius from the outer

most point of the building are covered. The WAP layout must be aligned to the performance specified for a Cisco Aironet 3702 WAP.

At the commencement of installation and on completion of installation, the Contractor must conduct a wireless survey to verify the designed installation is satisfactory in the context of the built structures.

Wireless Access Points must be installed in readily accessible locations that do not require specialist equipment to access and in locations which do not cause interference. Wireless Access Points must not be installed within ceiling spaces.

#### **12.4. VoIP Telephony design and cabling**

The Contractor must design the telephony layout to ensure that teachers and 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 should be provided with telephone access within their designated work areas or offices. Telephone access should also be provided in teacher's staff workspaces; the staff lounge; and conference, meeting and consulting rooms.

As part of the data network, the Contractor must provide a data outlet for telephone handsets for each location proposed in its design of the permanent buildings.

#### **12.5. Master antenna television system**

The Contractor must 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 must comply with all relevant standards, codes and regulations of the Authorities having jurisdiction over such works.

The system must provide the best available signal for all free-to-air channels available in the locality. The system must be fully tested and commissioned, demonstrating suitable reception across all available channels.

##### **12.5.1. Television Antenna**

The antenna system must provide the best possible signal, free of interference, ghosting and other visual or audible impairments. It must 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 must 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 must be made for wind loading on the support structure design for the antenna.

##### **12.5.2. Antenna outlets**

The system outlets must be mounted on wall plates to match the room GPO switch plates in style and colour. Outlets must be socket type suitable for use with an MATV system, and incorporate mains voltage isolation. Cable connections to wall outlets must be F type co-axial connectors.

#### **12.6. Public address system**

##### **12.6.1. Overview**

The Contractor must provide an IP network based public address (PA) system that covers the School and the Site.

The Contractor must provide cabling infrastructure, which supports all services being delivered and the active PA system equipment.

The scope of the installation must include all Transportable Classrooms scheduled for installation on the Site prior to Commercial Acceptance of the relevant School, and must 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 must 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 must provide a digital zoned PA system suitable for announcements and media information. The PA system must employ audio distribution and control over the Contractor-managed Building Services Network (BSN) infrastructure. Paging microphone stations and zone selection controls must interface with the PA system via the IP network. The PA system must be capable of directing messages to selected zones, without these messages being heard in other zones. The PA controls must enable the selection and de-selection of zones in a simple and quick manner. The PA System zone arrangement must 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);
- must 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 lock down procedure; and
- must provide an automatic announcement facility for making routine, situational and emergency announcements.

All the main functions must be provided by the PA system. The PA system must be simple and logical to operate for staff. The PA system must provide a means to give customised indications for the selection buttons of the call stations. The PA system must store at least the last 200 fault messages in the memory of the network controller.

The PA system must only allow one microphone to announce a message on the selected zone. Any other microphone that tries to select this zone, must not be able to announce their message until the first microphone has de-selected this zone.

The PA system must 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) must not be less than 0.5 in at least 75% of each area of coverage and should not fall below 0.45 for the remaining 25% of each area.

### 12.6.4. School bell

School bell services must be achieved using the PA system.

## 12.7. Audiovisual systems

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 must:

- define the required locations in the design documentation;
- provide cable pathways for audiovisual systems that allow easy post construction installation; and
- install all cabling in concealed, continuous lengths.

The Contractor must 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 must 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 must be readily accessible for maintenance purposes and not require specialist access equipment; and must be positioned to obtain a minimum 100° (diagonal) viewing area.

In addition to the cabling and digital display screens that are deemed necessary by the Contractor to meet the requirements of the Functional Brief (Volume 2, Part A), the Contractor must 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 Contractor-provided Building Systems Network. This connection must be made through an IP/GPRS card operating on the Security System. The Contractor must provide the necessary data connections, and connect and configure the intruder alarm system, in consultation with SSICT and the incumbent security monitoring company.

### 12.9. Sound system and intercom system for emergency purposes

The Contractor must install a sound system and intercom system for emergency purposes where required by BCA. The system must be capable of automatic voice messaging and manual announcements from trained fire wardens. The Evacuation Control Panel must 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 will be warned of an impending evacuation.

The system must be installed complying with the requirements of the applicable codes and standards

The system must 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;
- 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; and
- 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 must be provided with a hearing augmentation system that complies with the requirements of the BCA (Part D3.7).

The Contractor must provide a hearing augmentation system in accordance with the requirements of the BCA and relevant Australian Standards. The hearing augmentation system (Audio Frequency Inductive Loop System) must 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. The hearing loop is required in space intended for video-conferencing in Learning Neighbourhoods. Loops installed in adjacent rooms shall be designed to maximise coverage and limit spill into any other space.

The Contractor must 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 must be adaptable to permit multiple users and a range of BYOD listening devices. It

must 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 will provide a hydraulic service system as described below.

### 13.1. Design criteria

The hydraulic services must satisfy the requirements of Icon Water Limited and the requirements of the Territory and Municipal Services Directorate.

### 13.2. Domestic water services

The Contractor must provide a domestic cold water service to accommodate the Peak Enrolment numbers and Non-Mandated Community Facilities for the School.

The Contractor must provide cold water to all required areas identified in the Functional Brief.

#### 13.2.1. Potable water services

The water supply system design must:

- be of Grade 2 alternative supply type in the form of mains pressure directly served from Supply Authority mains;
- each domestic water tapping from the mains will extend individually to the Site complete with all necessary isolation valves, backflow prevention and pressure limiting 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 water supply is inadequate for domestic water supply purposes an alternative supply comprising storage tanks and pumps must be installed;
- domestic water supply pumps of sufficient capacity must be installed to supplement water supply pressure where inadequate pressure is available. Supply pumps must be sized for 120% of maximum simultaneous demand;
- provide bypass lines around storage tanks and pumps;
- provide additional valved water branches and system adequacy to allow for the installation of Transportable Classrooms to accommodate Peak Enrolment; and
- provide valved potable water points to allow for the temporary supplies to mobile vans such as dental vans and the like.

#### 13.2.2. Non potable water services

The School must be provided with a separate pipe system for reticulation of non-potable water, taken from source (either reticulated neighbourhood supply or water 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 must be used for non-potable purposes and must be separately metered. The non-potable water system must comprise the following:

- rainwater harvest systems must be designed with filtration and disinfection to remove health risks from water spray or accidental ingestion, and ensure water quality is visually clear;
- safety warning signage must 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 must have 100% capacity plus domestic water make-up, based on tanks assumed empty; and
- 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.

### 13.2.3. Pipework, valves and fittings

The Contractor must provide pipe work, valves and fittings that allow for the following:

- valves and fittings must be located to ensure control of supply to all buildings, control all sections of the ring main for shutdown for maintenance and enable for new branches to be 'cut in'. Valves must be selected to be capable of 1.5 times the working pressure of the systems;
- service valves must be located where the risk of tampering by users and / or visitors is minimised. Valves must be installed at a safe working height above in locations that meet all relevant OHS Legislation, principles and guidelines and appropriately labelled;
- valves must 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 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  $\pm 50$ kPa;
- supply must 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 must meet the design load for Peak Enrolment numbers plus 20% spare capacity;
- pipes must 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 must not be cast-in concrete and water pipe work must be designed to eliminate any risk of "blue water".

### 13.2.4. Tap outlets and fixtures

The Contractor must provide all necessary tap outlets and fixtures as described within Section 5 (Building Fabric).

Tap outlets and fixtures must meet the minimum water efficiency requirements as outlined in Section 7.5.1(Water consumption – sanitaryware and tapware).

All irrigation systems must 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 must be a general distribution of external taps for garden watering, irrigation and general School use.

### 13.2.5. Water storage

The system must incorporate the following where storage tanks are required to be installed:

- storage tanks for both potable and / or non-potable water supplies, must be duplicated and each tank must 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 must be sized for minimum of 24 hours of supply;
- infill supply for each tank must comprise a high pressure ball float valves for each supply; and
- storage tanks must 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.

### 13.2.6. Potable and non-potable pressure boosting pumps

The system must incorporate the following:

- pump sets must comprise dual multi-stage variable speed constant pressure pumps of stainless steel construction connected in parallel with 316 stainless steel inlet and outlet manifolds;
- control panels must be touch screen programmable logic controllers (PLC) interface mounted on front panel showing operational and alarms status;
- pumps must have integrated variable speed drives;
- minimum functions must include:
  - manual override outside control panel;
  - low and over pressure shut down;
  - standby pump redundancy with automatic changeover;
  - separate transducer for each pump;
  - automatic alternating duty-standby operation with manual override;
  - dry running protection for each pump;
  - status and alarm monitoring to the BMS;
  - bypass valve assembly;
  - positive suction head;
  - stainless steel non-return valve to each pump;
  - isolation valves on each valve for removal of pump and non-return valve from manifolds;
  - duplicate diaphragm tanks;
  - vibration dampers on each pump;
  - safety switch on individual pumps;
  - phase failure protection on each pump;
  - voltmeter, ammeter on key pad interface;
  - operation light for each pump;
  - fault light for each pump;
  - emergency operation switch;
  - Radio Frequency Interference (RFI) filters on each pump; and
  - shield cables from motors to control.
- duty pumps must be capable of system demand based on Peak Enrolment numbers plus 20% spare capacity, and capable of the capped speed increased for potential future duty; and
- select only pump sets from manufacturers that have a history of reliable local technical support and spare parts.

## 13.3. Heated water

### 13.3.1. 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 must 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 must 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 must be generated and delivered through main pipe lines at a minimum of 60°C to inhibit the growth of legionella bacteria;
- maximum supply temperature of 45°C must 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. Thermal mixing valves (TMVs) must 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 must be installed to supplement water supply pressure where inadequate pressure is available. Supply pumps must be sized for 120% of maximum simultaneous demand;
- The Contractor must 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 must 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 must be energy efficient and gas units must have a Five Star Rating Energy Label or better. Timers for shut down on holidays, weekends, night time and curriculum days must be considered.

### 13.3.2. Generation systems

The Contractor must determine the most suitable method of generating heated water systems for the Site, which may be one of the options below:

- gas fired central plant comprising multiple gas fired Domestic Hot Water (DHW) units coupled with storage tanks and pumps for supply to main flow and return systems;
- stand alone electric or gas for satellite fixture or outlets;
- solar hot water panels;
- base heating plant must be sized to provide full capacity without solar contribution.

Regardless of the system selected, 20% spare heating and storage capacity must be provided in the design that must be based upon Peak Enrolment numbers, code, and product requirements.

Circulating pumps must comprise mechanical seals, duplicated duty/standby, variable speed drive (VSD) fitted, at least 120% of design duty based on Peak Enrolment numbers and high efficiency motors.

All external hot water plant and flues must be provided with appropriate protection to prevent injury or theft.

### 13.3.3. Pipework valves and fittings

The Contractor must provide pipe work, valves and fittings that allow for the following:

- valves and fittings must be located to ensure control of supply to all building control also enabling new branches to be 'cut in'. Valves must be selected to be capable of 1.5 times the working pressure of the systems;
- service valves must be located to minimise the risk of tampering by users and / or visitors. Valves must be installed at a safe working height above in locations that meet all relevant OHS Legislation, principles and guidelines and be appropriately labelled;
- valves must 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  $\pm 50$ kPa;
- supply must 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 must meet Peak Enrolment numbers load plus 20%;
- temperature control valves / thermostatic mixing valves installed where supplies must be delivered at 45°C and with tempering valves acceptable in other areas;
- the system must 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 must be fully accessible;
- isolation and balancing valves must be provided on all systems; and
- where heated water systems are to generate and deliver a warm water system, ultra violet disinfection and other similar measures must 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 must 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 must provide a sewer system that allows for the following:

- the sewer system must 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 must discharge to the Site boundary and connect to the Authority connection point via a boundary trap or other approved Authority device;
- where sewer drains can not gravitate to the boundary point, a local pump well system must be installed complete with dual sewerage pumps of sufficient capacity to suit the volume to be discharged. The pumps must operate in automatic reciprocal duty. The pump discharge must 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 must be ventilated to atmosphere in locations that do not cause nuisance to Users;
- inspection openings for maintenance purposes;
- inspection openings under pavements must be made with inspection shafts;
- inspection openings at the end of each pipe line in each building must be extended to surface level with sealed risers to act as clear out points that must 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 must 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 must 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 must be a minimum of 100mm in diameter;
- all sewer stacks must 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) must 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 must be located against structural elements such as columns.

#### **13.4.4. Pipework and fittings**

The Contractor must 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 must be acoustically treated when passing through sound sensitive areas;
- air admittance vents may be utilised, however, each stack must be fitted with a vent to atmosphere finishing above the highest roof level of the building served;
- vents must not be flush with or at the building façade; and
- tundishes must be visible for inspection.

#### **13.4.5. Sewerage treatment system**

The Contractor must 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 facility or plant must be of sufficient capacity to cater for the entire sewerage volume that may be generated from the Site;

- the treatment plant must include all necessary chambers, filters and the like to ensure that the sewerage discharge is treated correctly; and
- discharge from the plant must 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 must provide a trade waste plumbing system to accommodate the Peak Enrolment numbers and Non-Mandated Community Facilities of the School.

#### **13.5.2. Trade waste system**

The Contractor must provide a trade waste system that allows for the following:

- be based on gravity design wherever possible, and must consolidate multiple sinks and fixtures;
- pipe work formed in suitable materials to meet the discharge requirements;
- pipe work requiring an acoustic rating must be acoustically lagged to meet the requirements;
- pipe work must not be cast-in concrete;
- acid wastes from laboratories must 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 must meet design load plus 20%;
- all graded wastes must be fitted with 'full-way' inspection openings and where concealed, must 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 must not be located in teaching or administration areas.

#### **13.5.3. Trade waste apparatus**

The Contractor must 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 must 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; and
- air admittance valves (AAVs) must not be installed in trade waste installation where chemicals are to be discharged.

### **13.6. Controls**

The Contractor must 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. Design Criteria

The Contractor must provide a fire hydrant, fire hose reel system at the Site that complies with the requirements of all applicable codes and standards, and that satisfies the requirements of the ACT Fire and Rescue in the Site location. The School must include a fire detection and audible alarm system. The works may include the installation of addressable fire indicator panels if the Contractor chooses to install them.

### 14.2. General requirements

The Contractor must provide fire systems to accommodate the Peak Enrolment numbers and Non-Mandated Community Facilities of the School and to allow for the expansion of school development on the Site necessary to accommodate Peak Enrolment.

All fire systems must be appropriately designed to minimise intentional misuse of the fire systems and fire protection equipment.

#### 14.2.1. Water supply

The Contractor must provide water supply to meet the following requirements:

- water supply must 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 must 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 must be installed;
- storage tanks must be of the minimum capacity to satisfy the required flows and must not be reduced in capacity based on infill flow rates;
- bypass lines around storage tanks and pumps must be provided; and
- all fire system test water must be reused where possible.

#### 14.2.2. Suction and booster system

The Contractor must 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 hard stand area if the booster assembly is not adjacent to a public road.

#### 14.2.3. Pipe work, valves and fittings

The Contractor must 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 must 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; and
- provision of all necessary signage and notices.

#### 14.2.4. Fire hydrants

The fire hydrant system must 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 must 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 must not be installed;
- consideration may be given to the use of street hydrants where appropriate and agreed with ACT Fire and Rescue ;
- external hydrants must 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 must be contained in metal cabinets; and
- external hydrant placement and coverage must consider possible and planned Transportable Classroom locations.

#### **14.2.5. Fire hose reels**

The Contractor must provide internal hose reels where required, and individually controlled outlets installed within a cabinet to suit building architecture. Hose reels must be located adjacent to building egress and other suitable shortfall locations to provide adequate protection. Fire hose reels must not be provided in external unsecured areas. The fire hose reel service must be metered to enable monitoring of use.

#### **14.2.6. Fire extinguishers**

The Contractor must install fully charged hand held 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.

#### **14.2.7. Fire blankets**

The Contractor must 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.

#### **14.2.8. Smoke detectors and sound alarms**

The Contractor must 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 must be installed in locations where normal activities may generate false alarm signals at smoke detectors.

The Contractor must ensure that the fire detection and alarm system is capable of extension to accommodate future Transportable Classrooms.

#### **14.2.9. Smoke and Fire Doors**

Magnetic hold-open devices must be provided to smoke and fire doors where these doors are placed across circulation corridors or in locations where students and staff must regularly pass. These devices must be controlled by an AS 1670 compliant fire detection and alarm system, and automatically deactivate on a fire alarm signal.

The fire door to the Secure Store and the BD1 space do not require magnetic hold open devices.

#### **14.2.10. Fire Indicator Panel**

Where the Contractor proposes to install fire indicator panels (FIP), they must 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 will identify all connected alarm circuits, and will be equipped with auto testing and check alarm facilities.

## 15. Acoustic Engineering

### 15.1. General

This section details the acoustic performance standards and requirements that the Contractor must meet for the School and for the spaces provided.

The Contractor must ensure the appropriate level of acoustic comfort relative to the function and use of spaces.

The acoustic performance of the Facilities must:

- control sound transfer between spaces;
- control room reverberation (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 must 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 rain-fall 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 including noise from building services and from external noise sources. These are presented as separate limits – that is, the noise limit for building services does not include noise ingress due to external noise sources and the noise limit for noise ingress does not include noise due to building services noise. Noise associated with activities relating to the Education Services is not included.

#### 15.2.1. Building services noise limits

The Contractor must meet the building service noise limits in accordance with the requirements of the Table 12.

The building services noise criteria must 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 must note that the:

- $L_{Aeq}$  is the A-weighted equivalent continuous sound pressure level;

- levels apply to finished, furnished but unoccupied spaces;
- noise must be absent of tonal or intermittent characteristics;
- limits apply to all building services operating normally and together, including hydraulic services, lighting, ventilation and extraction fans, ceiling fans operating at the design duty and any other plant items that would operate occasionally during the normal teaching day;
- night-time boundary noise limits must be met for plant operating out of school normal hours (e.g. late night purge fans); and
- noise criteria for ventilation equipment only operating during emergencies can be relaxed by 10dB from that given in Table 12.

### 15.2.2. External noise ingress

Noise ingress due to sources outside the School must be limited to comply with the requirements of Table 12.

The Contractor must note that the:

- $L_{A10}$  is the A-weighted noise level exceeded for 10% of the measurement period and is representative of the ‘average maximum’ noise level, and applies for the whole of normal teaching hours; and
- the noise limit must not be exceeded with the windows closed on the basis that teachers must 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 must provide sufficient ventilation / cooling to enable an acceptable internal comfort environment to be achieved with the windows closed.

The Contractor must consider 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 or when used as a voting place in Territory or Federal elections.

### 15.2.3. Rain noise

Based on a rainfall rate of 15mm/hr per hour, the Contractor must provide roof constructions (including consideration of rain noise intrusion from roof level sources such as roof lights and clerestory windows) to comply with the rain noise limits in accordance with the requirements of Table 12.

**Table 12 – Noise limits**

Type of room	Ventilation Noise (dB $L_{Aeq}$ )	Rain noise @ 15mm/hr	Noise Intrusion (dB $L_{A10, 30 min}$ )
Classrooms, general teaching areas, seminar rooms, tutorial rooms, language laboratories, small group rooms, library/ learning resource centre	35	40	35
<i>Open plan (See also Section 15.4.2) and Learning Community areas</i>			
Teaching areas	40	45	40
Resource/Breakout areas			
Music classroom			
Small and large practice/group room	35	40	35
Performance / recital / drama room/dance			
Teaching spaces in Learning Support Units and elsewhere specifically intended for students with special hearing and communication needs and spaces for special needs students	30	30	30
Study room (individual study, withdrawal, remedial work, teacher preparation)	40	45	40

Type of room	Ventilation Noise (dB <sub>L<sub>Aeq</sub></sub> )	Rain noise @ 15mm/hr	Noise Intrusion (dB L <sub>A10, 30 min</sub> )
Quiet study areas	40	45	40
Resource areas	40	45	40
Science laboratories – teaching areas	40	45	40
Fume Cupboards (@1m from sash)	55		
Resistant materials, CAD and design areas	40	45	40
Electronics/control, textiles, food, graphics, design/resource areas, ICT rooms, art	40	45	40
Drama studios, assembly halls, multi-purpose halls (drama, physical education, audio/visual presentations, assembly, occasional music)	35	40	35
Atria, circulation spaces used for circulation and socialising but not teaching and learning	45	50	45
Sports halls (where provided for sport use only– see separate entry above for multi-purpose halls and assembly spaces)	50	55	50
Meeting rooms, Interviewing/counselling rooms, video conference rooms	40	45	40
Dining rooms	45	50	45
Kitchens, Laundries, Canteen	60	65	60
Offices, medical rooms, staff rooms, technician's area	40	45	40
Corridors, stairwells, coats and locker areas	45	50	45
Changing areas	50	55	50
Toilets	50	55	50

### 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 must provide the minimum airborne sound insulation in accordance with the Table 14. The airborne sound insulation requirements are provided in terms of the weighted standardised level difference,  $D_{nTW}$  values between two spaces. These apply to partitions where there are no doors and where there is not extensive glazing.

**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		

Type of room	Activity noise (Source room)	Noise tolerance (Receiving 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
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	Medium
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 $D_{nTw}$		Activity noise in source room			
Noise Tolerance in Receiving Room		Low	Average	High	Very High
	High	not applicable	35	45	55
	Medium	40	45	50	55
	Low	45	50	55	55

The Contractor must note that:

- $D_{nTw}$  is calculated according to AS/NZS ISO 717.1. The value of T to be assumed must be 0.5s;

- prediction of  $D_{nTw}$  between two spaces must be conducted in both directions;
- where partitions include significant glazing and/or doors, the requirements of 14.3.2 shall apply; and
- $D_{nTw}$  is an on-site performance and the reduction in laboratory sound insulation performance with respect to on-site of construction must be taken into consideration in the selection of appropriate constructions.

### 15.3.2. Circulation spaces and partitions with doors or extensive glazing

The Contractor must provide constructions between rooms and circulation spaces with the minimum weighted sound reduction performance provided in the table below:

**Table 15 - Sound insulation requirements to circulation spaces and partitions with doors or extensive glazing**

Type of space	Minimum $R_w$	
	Wall including glazing	Doorset
All spaces except music rooms	38	30
Music Rooms	45	35
Spaces separated by sliding doors	40	25
Operable walls between music spaces	- (treated as a doorset)	51
Operable walls other than between music spaces	- (treated as a doorset)	45
Bounding walls beside and above an operable wall	Equal to the minimum $R_w$ of the operable wall	

The Contractor must 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; 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 only to doorsets in corridor walls for:

- teaching/learning spaces;
- counselling rooms;
- interview rooms;
- conference rooms; and
- private offices.

For partitions with a door, in addition to the above, the Contractor must demonstrate (by testing) that the installed level difference ( $D_w$ ) measured with a microphone at 1m from either side of the partition/door is not less than 4dB less than the specified  $D_w$  performance of the doorset as given above in Table 15. This shall apply at any location along the partition, including adjacent to the door. For operable walls, the in-situ  $D_w$  performance shall be 6dB less than the  $R_w$  rating.

### 15.3.3. Operable walls

For operable walls, Project Co must provide the minimum airborne sound insulation performance detailed in Table 16. The airborne sound insulation requirements are provided in terms of the weighted standardised level difference,  $D_{nTw}$  values between two spaces.

**Table 16- Sound insulation requirements for operable walls**

Type of space	Minimum $R_w$	Minimum $D_{nTw}$
	Operable Wall Design Requirement	Doorset Operable Wall On-Site Performance Requirement
Operable walls between all spaces except music rooms	45	39
Operable walls between music rooms	51	45

Project Co must note that the:

- $D_{nTw}$  is calculated according to AS/NZS ISO 717.1 and tested in general accordance with ISO 140.4. The value of T to be assumed must be 0.5s;
- prediction of  $D_{nTw}$  between two spaces must be conducted in both directions;
- $D_{nTw}$  is an on-site performance and the reduction in laboratory sound insulation performance with respect to on site construction must be taken into consideration in the selection of appropriate constructions; and
- Project Co will select operable walls to achieve the  $R_w$  ratings detailed in Table 16 above. The operable wall supplier will be responsible for achieving the on-site  $D_{nTw}$  performance detailed in Table 16.

## 15.4. Room acoustics

### 15.4.1. General spaces

The Contractor must achieve the mid frequency reverberation times in accordance with the requirements below in Table 14, to provide a suitable acoustic environment for the activities expected in each space. They apply to finished, furnished but unoccupied spaces. Where acoustic performance is modelled in the design process, the modelling must be based on the intended space, finishing materials, and extent of acoustic moderating materials that will be delivered in the finished project.

The Contractor must note that the:

- rooms must be free of acoustic defects such as flutter echoes, focussing etc.; and
- mid frequency reverberation time is the arithmetic average of the values in the 500 Hz and 1 kHz and 2 kHz octave bands.

**Table 17 - Mid frequency reverberation time values**

Type of room	Mid Frequency RT
P-6 year levels: classrooms, class bases, general teaching areas, small group rooms Sensory calming rooms	$\leq 0.6$
7-12 year levels: classrooms, general teaching areas, seminar rooms, tutorial rooms, language laboratories  Study room (individual study, withdrawal, remedial work, teacher preparation)  Science laboratories  Materials technology, CAD and design areas, Electronics/control, textiles, food, graphics, design/resource areas, ICT rooms, art	$\leq 0.8$

Type of room	Mid Frequency RT
Materials technology machines, adaptable project space, workshop	Provide a robust sound absorptive finish to at least 70% of the ceiling
<i>Open plan and Learning Community areas</i> Teaching areas Resource/Breakout areas	≤ 0.5 [see Section 15.4.2] ≤ 1.2 [see Section 15.4.2]
<i>Music</i> music classroom Practice/group room, volume ≤ 30 m <sup>3</sup> Practice/group room, volume > 30 m <sup>3</sup> Ensemble room, Live room Performance/recital room/ Dance	≤ 1.0 ≤ 0.6 ≤ 0.8 0.6 - 1.2 1.0 - 1.5
Teaching spaces specifically for students with special hearing or communication needs	T ≤ 0.4 averaged from 125 Hz to 4kHz octave band centre frequencies and T ≤ 0.6 s in every octave band in this range.
Library/ learning resource centre	≤ 1.0
Assembly halls, multi-purpose halls (drama, PE, audio/visual presentations, assembly, occasional music)	0.8- 1.2
Indoor sports halls	≤ 2.0
Gymnasium/activity studio	≤ 1.5
Meeting rooms, Interviewing/counselling rooms, video conference rooms	≤ 0.8
Dining rooms	≤ 1.0
Kitchens Laundries Offices, medical rooms, staff rooms Corridors, stairwells  Coats and locker areas, changing areas Toilets	≤ 1.5 ≤ 1.0 Provide a robust sound absorptive finish to at least 70% of the ceiling in all fully enclosed corridors ≤ 1.5 ≤ 1.5

### 15.4.2. Open plan classrooms

Open plan classrooms and inter-connected contiguous spaces in Learning Communities 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 must 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 must not exceed STI of <0.3 (to minimise interference between different activities).

The background noise component in the STI calculation must include:

- activity noise from adjacent activity areas;
- indoor ambient noise due to mechanical services; and
- transmitted noise from outside.

To assist with this, the sound power levels from the following table must 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 re10-12W)**

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 must note that:

- the STI must be calculated based upon the expected layout and activities (including teaching and studying) and transmitted noise from adjacent spaces;
- a computer model must be created and the STI predicted;
- the overall noise level must 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; and
- 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 must ensure that vibrations from building services plant does not result in excessive noise that exceeds the building services noise limits as set out in Table 12. In addition, surface vibration (rms velocity) in occupied areas is not to be perceptible.

Vibration levels in occupied spaces must 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 must 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 Contractor must comply with 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) must 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 must meet the requirements of the Environmental Protection Act 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) must 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 must not exceed the following levels on the Site:

- 55  $dB_{LAeq,30mins}$  - in playing fields or other outdoor areas; and
- 50  $dB_{LAeq,30mins}$  - in outdoor teaching areas.

Rooms to be used for music performance / rehearsal must 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 must comply with the internal and external noise limits (including the requirements of SEPP N1).

The Contractor must locate Plant outside of and away from noise sensitive spaces with appropriate safe access for maintenance.

Care will need to be taken so that regenerated noise from bends and take-offs is low enough to ensure that the noise limits are met. This must 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); and
- controlling velocities in ducts serving the spaces to be adequately low.

Terminal units i.e. grilles and diffusers must 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 must ensure that mechanical and electrical services do not undermine the sound insulation requirements. The Contractor must comply with the following:

- acoustic bounding walls must extend to the roof space if the ceiling construction and lining is not effective as an acoustic boundary; and
- flexible ductwork must not pass through full height partitions.

Note also that:

- 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 is required;
- above ceiling plena may require attenuation if walls are full height;
- air transfer grilles in any sound insulating constructions (including doors) must be avoided or attenuated;
- all ductwork / pipework / cable penetrations must 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 must 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 must not be fixed to any wall shared with a teaching or office space without incorporating additional acoustic treatment to control noise and vibration; and
- electrical penetrations (such as GPO's) must be staggered across wall studs. If back-to-back electrical penetrations are unavoidable, an appropriate acoustically rated backing box must be used.

### 15.10. External noise ingress

The Contractor must comply with the noise ingress limits in accordance with the requirements of the Table 12.

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 must seal effectively.

Light weight roofing systems must be provided with additional acoustic and noise dampening treatments to meet the rain noise limits.

### 15.10.1. Sound insulation

#### 15.10.1.1. Walls and Partitions

Appropriately sized zones to accommodate the space requirements of sound insulating constructions must be considered during early planning.

Music rooms will be noisy and must 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 must be designed and constructed to manage acoustic containment.

Placement of toilet and amenity spaces must 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 must be constructed and insulated to prevent noise intrusion to adjacent spaces.

The Contractor must provide partitions (including glazed and operable partitions) to meet the minimum sound insulation requirements in accordance with Table 13 and Table 14.

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 must be specifically considered where spaces are not mechanically ventilated. Where there is risk of disturbance the windows must be placed as far apart as practicable.

Consideration must 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 must 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 must be appropriately sealed (including those in the ceiling cavity barriers); and
- Acoustic rated bounding partitions must 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 must be provided if a suspended timber floor is used in lieu of a concrete slab.

#### 15.10.1.2. Doors

Doors must meet the required minimum sound insulation performance in accordance with the requirements of Table 14 and 15.

Doors to adjacent spaces must be placed as far apart as practicable. Doors in rooms opposite each other must be offset.

The Contractor must provide doors which can be easily opened by Users of all ages and abilities.

The hardware and door seals on doors must be appropriate for the heavy usage that doors will be subject to:

- the sealing mechanisms of doors must allow for the accommodation of building tolerances and of floor level variations, must work with the selected floor finish and must be site-adjustable and maintainable;

- lobbied doorsets can be used to provide a higher level of sound insulation using doors with a lower acoustic performance;
- air transfer grilles must not be installed in acoustic doors and doors in acoustic rated walls; and
- if required, the Contractor must 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 must design and incorporate sound absorbing treatments so as to avoid all acoustic defects i.e. echo, flutter echo, focussing. If required, the Contractor must provide acoustic treatment on walls as well as ceilings (e.g., gyms, music spaces, etc.) in order to achieve the specified performance identified in Table 15.

### **15.11. Others**

The Contractor must locate noisy equipment so that it does not cause nuisance and disturbance to Users and to neighbours. Where possible, the Contractor must locate the equipment in a separate room. Where this is not possible the Contractor must use appropriate barriers to reduce the noise in adjacent spaces/areas. Externally mounted noisy equipment must be positioned remote from openable windows and doors.

## 16. Security Technology

### 16.1. Overview

The Contractor must provide electronic security systems for intrusion detection to the School. Where Non-Mandated Community Facilities are integrated with School buildings, the electronic security systems must cover all protected spaces in all buildings.

The Territory will separately engage a company to provide remote security monitoring services across all ACT schools. The Contractor must allow to coordinate with the signalling requirements of the incumbent security monitoring company. The installed system must communicate with the remote monitoring station, providing immediate notification to the station of all security alarms at the School.

### 16.2. Standards, references and specifications

Equipment and infrastructure must comply with the applicable requirements of the documents listed below. The security services design, installation and operation must 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 Education Directorate Security Guidelines (current version); and
- ACT Education Directorate 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 must supply and install an intruder alarm system at the School. The system must utilise dual technology (passive infrared and microwave) detectors (PIRs). Detectors must be positioned based on design for the School, including the number of external entry points and the configuration of internal spaces.

The deployment of PIR motion detection sensors must 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 must 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 must be placed to cover the length of internal corridors and circulation spaces – with detector spacing not to exceed 15m. The coverage of PIRs must overlap to provide cross coverage.

PIR motion detection sensors must only be activated when the intruder's mass exceeds 30kg.

The security system must 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 must 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 must include all Transportable Classrooms scheduled for installation on the Site prior to Commercial Acceptance of the relevant School, and must 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 must 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 must include internal sirens distributed through the buildings, which must initiate a high volume audible signal when an intrusion is detected. The intruder alarm system must not include externally mounted sirens that deliver a signal that will cause nuisance to neighbours. The volume of internal sirens must meet ACT noise regulation compliance requirements.

The system must include an internally mounted blue strobe light, that is visible from the street at the main point of entry, and which must 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/ Neighbourhoods Corridor junctions, stairways, points of entry Music room/ instrument storage Art areas Media studio and store Laboratories or store rooms where dangerous chemicals are stored
2 – Medium Priority	Principal's office Senior personnel offices Audio visual rooms	Principal's office Senior personnel offices Audio visual rooms Materials technology areas
3 – Low Priority	Gym Gym store	Gym Gym store Home economics/ food technology

The necessary locations and quantities of remote arming station (RAS) / keypads must 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 must 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 / keypad shall be required in each School.

If photovoltaic (PV) solar panels are installed on the roof of the School, these panels must be protected against theft using movement sensors (suitable for exposed outdoor service) installed on the panels and connected to the intruder alarm system.

#### 16.4. Duress alarm

Duress alarm buttons must 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 Principal's meeting space; and
- the first aid room/ Sick Bay.

Each button must 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 Principal's meeting space to alert staff members that a duress incident has happened in the School.

### 16.5. 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 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 must be undertaken with the Territory to determine which access doors are to be provided with access control.

The proximity card access system and installation must comply with the following requirements:

- the intruder alarm system and the access control system must operate as two fully separated systems with no integration. The access control system must not arm, disarm or override the intruder alarm system;
- the access control system must be expandable;
- the access control system cards must 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 must 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 must remain locked. A mushroom cap release button must be installed at the secure side (inside) of a door. The release unit must be connected directly in series with the power supply unit of the electronic door lock. When the release unit is activated, it must release the lock immediately. The status of the release unit must be monitored by the access control system;
- back-up batteries or UPS that comply with the requirements of the relevant Australian Standards must be provided to sustain security and prevent default release of controlled doors in the event of a failure of mains power; and
- the Contractor must 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; and
  - the cancellation and deletion of any existing issued cards.

### 16.6. Physical Security

The Contractor must provide the following physical security measures:

- secure locking to external doors and openable windows;

- the meeting room off the entry foyer must 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; and
- fencing as described in the External Environments section of Volume 2 Part B.

## 16.7. School Lockout and Lockdown procedures

The Contractor's active security technology and physical security measures must support the quick implementation – by school staff - of Lockdown and Lockout procedures.

### 16.7.1. 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 must remain in secure locations until the situation has been declared safe by an authorised person (e.g. principal or emergency services officer).

The School design and the security design must 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.

### 16.7.2. 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 must 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.

## 16.8. CCTV monitoring

Closed Circuit TV (CCTV) monitoring is not mandated for the School. The Contractor must 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 must firstly contact the Education Directorate 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; and
- obtain the approval of the Education Directorate Project Officer.

## 17. Vertical Transportation

### 17.1. General requirements

If the Contractor's design proposes multiple storeys or split level floors in any building, the Contractor must 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 must meet the following requirements:

- the lifts must be key or swipe card protected, providing controlled access and use for disabled students, visitors, and members of staff only;
- the lifts must 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; and
- lift capacity and lift car design must be accessible and appropriate for its intended use.

### 17.2. Compliance with codes and standards

To the extent that lifts are provided, they must 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 must comply with AS 1735.14, the relevant DDA legislation, and the requirements of the Building Code of Australia Section E 3.6.

## 18. External elements and landscape works

### 18.1. Student play settings

#### 18.1.1. Play equipment

The Contractor must provide specialised playground play equipment for all schools. Playground equipment must 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 must be able to access and enjoy multiple play options regardless of their individual circumstances.

While safety is a priority, play spaces must also be inclusive, challenging and exciting environments. Play equipment and play areas must 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 must be accessible by students in wheelchairs. Where soft fall is provided it must 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 must be provided for wheelchairs.

Playground equipment must conform to the following requirements;

- all equipment must be securely fixed to footings unless specifically designed to be portable;
- must comply with AS 4685-2014, and be robust and low maintenance;
- must 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:
  - Prep to Grade 2 – Play spaces with a focus on imaginative and creative play, with a minimum play equipment capacity of 30% 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 20% 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 15% 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 15% of the LTE numbers of this age group at any one time. For this age group, external equipment provided for sport and fitness must 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 must be arranged to form an exercise circuit along a paved pathway.
- must be located in close proximity to the Learning Neighbourhoods within the areas designed to be used for recess and lunchtime activity periods;
- must be placed in locations that facilitate supervision by a limited number of school staff;
- must limit access to less than 3 metres above grade level;
- must 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 must be at least 2.5 metres between items of equipment; and

- shading systems must be provided to cover and offer adequate protection from the sun to all playground equipment. The Contractor must refer to Shade Areas of this Section for additional details of requirements for shading.

The Contractor must 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 59 – 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 must 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 must 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. Sand pits

Sand pits must 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 must be designed to prevent the sand from being distributed into adjacent areas. They should be located more than 15m from any building entry and surrounded by raised edges with defined areas for ambulant disabled access. The Contractor must 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.

### 18.1.3. Informal play areas

Informal play areas must include defined external spaces for small groups of students to congregate and engage in quiet, creative play. There must be a minimum of one 'informal play space' for each class each with a capacity of 5-10 students. Informal play spaces should be defined by planting that is low enough to permit passive supervision by staff on yard duty. Where feasible, informal play spaces must incorporate natural materials. The informal play spaces must be shaded by built shade or natural shade.

### 18.1.4. External safe play areas

Associated with areas in the design where Learning Support functions can be accommodated, the building design and Site planning must 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 must 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.

### 18.1.5. Pre-school play area

The Preschool area must have its own dedicated and securely fenced play area. This area must 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) must 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 must 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 must be installed to provide protection where the landscape design includes changes of level greater than 800mm. Fencing must 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 must 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 must 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 – must 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 must 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) must be installed across the open spaces between buildings, in order that the central courtyard can be secured out of hours. Each section of fence must incorporate wide double gates (lockable) to permit free movement of users during school hours. Boundary fencing each side of the public entrance must return back to the building line to define the limits of the publicly accessible area. This front fence must weave continuously around indented functions on site such as car parking;
  - The preschool play area must 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 must be secured with pool-type plunger latches; and
  - All above ground water tanks must 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 must have landscaped treatment to soften and define the space as the school frontage.
- Lockable gates must be provided in fences at each point of pedestrian and vehicle entry (except the main school entry). Double gates must 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 must 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 must 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 carpark, 6m high chain wire screen fencing (ball barrier) must 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 must be provided to the perimeter of the hard court run-off.
- The boundaries of car parking areas must be fenced if adjacent to an activity area or accessible to students.
- The school bus bay must be fenced and gated.

All school fences adjacent to public pathways must be set back a minimum of 500mm from the pathway. Chain mesh fencing must not be used as the boundary fence type along street frontages. The public (outside) of the fence structure must not present footholds, posts or rails that would assist in climbing. A concrete mowing strip must be provided below or each side of all fencing panels.

### 18.3. Covered ways

Covered ways must 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 must be stable, robust and durable - suited to external and exposed locations. The roof areas must 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 must minimise the number of structural columns.

Artificial lighting must 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 must not facilitate unauthorised access to the roof areas of buildings.

### 18.4. Bicycle/ scooter shelters

The Contractor must provide covered, paved, secure shelters bicycles in accordance with the following requirements:

- bicycle and scooter parking must be easily accessible and designed to minimise conflict with flows of pedestrians and vehicles;
- perimeter fencing must be 2.4m height chain wire or similar with locking gates; permitting passive supervision;
- bicycle racks must be securely fixed to the floor or wall and must be non-removable;
- bicycle racks must 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 must be able to be locked with a U-shaped lock;
- for staff bike parking, the bike racks must fit standard size adult bicycles, and must be located in a storage facility separated from any student bike shelter (and with access control at the gate);
- bicycle storage must be provided to suit the age and height of the intended users across all Facilities;
- the location of the bicycle shelters must allow users to ride to within 30m of the bike shelter on a 1.8m width paved pathway;
- bicycle shelters must be visible from the School, permitting passive supervision;
- lighting must provide good visibility within the bicycle/ scooter shelter;
- gates must permit easy unobstructed passage for bicycles; and
- signage must indicate procedures for locking bicycles and doors or gates.

The Contractor must 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).
- 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).

### 18.5. School Store

A secure store facility is required to store the school's outdoor equipment (including hoses, sprinklers, mowers, edge trimmers, leaf blowers, BBQ, etc.). Direct external access via a lockable roller shutter is required. The store must 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 must be provided at the Site that provides space for storage of waste hoppers or bins and for the collection of school waste. Screen fencing must be used to contain the area. The waste disposal facility pavement must be bounded by concrete kerbs. A hose cock and drainage sump must 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 must 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 must 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 must 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 must provide both formal and informal outdoor seating.

The Contractor must 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 must 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 must be designed to shed water and return to a reasonably dry state quickly after the cessation of rain. At least 50% of seating must 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 must be considered at primary schools for story-telling, 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 must 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, must support the ACT Waste Management Strategy 2011 – 2025 (refer to Technical Specification Section 8.8 and 8.8.1).

The Contractor must 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 must 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 must provide drinking fountains at the School that incorporate a drinking bottle re-fill faucet. These fountains must be:

- appropriate to the age and height of users;
- dispersed throughout the school;
- located near active play and sports areas (including the indoor games court);
- located in convenient areas that require suitable activation;
- accessible by students in a wheelchair; and
- comply with the requirements specified in the Hydraulics section of this Technical Specification.

### 18.7.4. Flagpoles

The Contractor must provide three flagpoles at the School, each 8.0m height above ground. The flagpoles must be installed in a straight line at a suitable location near the front of the Site. Each flagpole must include a lockable stainless steel wire halyard and all other attachments needed to raise and lower a flag.

An all-weather pavement must be provided to the base of the flagpoles.

### 18.7.5. Letterbox

The Contractor must provide a lockable, commercial quality letterbox, located adjacent to the footpath on the school's main entry path. The letterbox must be:

- durable metal construction, corrosion resistant, weather proof 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 must provide a minimum of 400m<sup>2</sup> of built shade for the School (in addition to the built shade specifically provided over one external hardcourt) that must:

- 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 must 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 must 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 must design soft and / or rough surfaces such as brick pavers and grass reflect 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 must 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; and
- take account of the daily / seasonal movements of the sun.

The effectiveness of built shade in meeting these requirements must 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 must retain and preserve all existing, suitable shade trees on Site to contribute to the provision of natural shade. Additional tree planting should 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 must be a major element of shade provision. The Contractor must:

- where possible, provide natural shade for the external areas except sports playing fields. Natural shade must 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 must take into account the direction of the sun and the time of day that the external space will be used;
- trees on the perimeter of the Site are to be planted to provide the maximum protection from prevailing seasonal winds, but are to be placed and maintained so as to not provide a climbing point to get over the boundary fence;
- provide deciduous tree species as shade trees (unless otherwise approved); 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 must provide soft landscaping for the School that complies with the current version of the TAMS 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 must 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 must be constructed so that soil and mulch is prevented from spreading to adjacent pavements or turfed areas; and
- appropriate surfacing for high traffic areas must be provided that will be durable and free from trip hazards.

Landscaping treatment (in various forms as specified in this section) must be provided for the whole of the Site (excluding areas covered by buildings, pedestrian pavements, road ways, 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 sites native and or endemic species should 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 must be positioned to provide functional outcomes such as shade and shelter as well as spatial benefits without compromising any built structures.

Tree species should be selected to be appropriate to the location, scale and functionality of the space, and should:

- 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 should be appropriately sized at planting with larger specimens selected for feature areas and shade or smaller sizes selected for lower profile areas and faster establishment:

- New feature trees and shade trees must 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 should be at a minimum density of four plants per m<sup>2</sup>. An active maintenance regime should 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 must 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 must be developed as general grassed areas either as synthetic turf or natural grass. “Dryland Grass” must not be used. Natural grass must not be used unless the slope permits safe maintenance (mowing). Where slopes are greater than 1 in 5, the Contractor must 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 under Section 6.2.2 of this Volume 2 Part B.

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 must be collocated with natural or built shade.

### 18.9.3. Irrigation of turf areas

Appropriate sub-surface water reticulation (e.g. drip lines) must be provided to enable turf areas to be established and maintained through all seasons.

Where available, irrigation water must 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 must 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 must be implemented to prevent “over irrigation”.

### 18.9.4. Water restrictions

The Contractor must 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 must be developed in accordance with the TAMS Design Standards for Urban Infrastructure, Section 24 – Sportsground Design;
- The Contractor must, where possible, utilise topsoil stripped from the Site due to building works to create flat playing areas.
- All playing surfaces must 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 must be able to accommodate the following sports fields:
  - For P-6 schools, an oval (of minimum size 110m x 90m (7,775m<sup>2</sup>)), 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 (17,496m<sup>2</sup>)), 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 will be orientated and marked in a north / south orientation. Where sports fields are configured for cricket, a synthetic turf wicket must 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 must be suitable for small groups to sit when grass is difficult to establish and maintain. Synthetic turf must be fit for purpose and durable. Short pile synthetic turf must be used in high wear areas, long pile synthetic turf must be used in smaller seating areas, and suitable pile lengths for sporting activities must be provided when used on sports playing fields. Synthetic turf must have a minimum 19mm pile length, a minimum 1000g/m<sup>2</sup> pile weight and be sand filled and well drained.

If the Contractor proposes synthetic turf, the product must 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 must 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 must 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 must provide garden beds in accordance to the following requirements:

- for a P-6 site, a minimum of 1500m<sup>2</sup> of “ground level” mulched garden beds must be provided to match existing grades and site contours;
- for a P-10 site, a minimum of minimum of 3500m<sup>2</sup> of “ground level” mulched garden beds must be provided to match existing grades and site contours;
- mass planting beds must be located away from areas likely to be heavy trafficked routes;
- a varied selection of low-water or drought tolerant plant species must be provided at a minimum density of four plants per m<sup>2</sup>, however, the use of dryland grasses is to be avoided;
- composts and mulches must be used in accordance with recognised standards;
- if fixed irrigation is provided, it must be by sub-soil systems (e.g. drip lines); and
- poisonous plants (flower, seed or leaf) or plants that are known allergens must not be used.

Planting must also be integrated with civil engineering and the site surface water management. Planting selections must 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

Where identified as a requirement in the Schedule of Project Specific Requirements, a fully accessible sensory garden (or gardens) must be developed. The sensory garden will 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 must 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 should provide a degree of screening from adjacent external areas.

The sensory garden must 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 must 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 must include winding paths, places to sit (both shaded and not shaded), and places for quiet play. Planting must include scented herbs, flowering species, and native grasses that attract native birds.

### 18.9.9. Productive gardens

A productive garden must be provided at the School. The productive garden should be fully accessible and located with access to sunlight, power and potable water. The garden must incorporate:

- a combination of in ground and raised garden beds 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 20 – 25 student 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 must 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 rain water 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 should be considered. The community garden will provide a space on the Site for the local community to plant and maintain vegetables and fruits. The community garden must 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), should be co-located with the school's productive garden. The community garden space must be provided with a unisex toilet. . The community garden should 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 must 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 must 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 must 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 must be provided that will act as the 'heart' of the school. It should be a large open space with smaller scaled edge spaces, which can be designed as Outdoor Learning Areas. It should be well located to be close to the classrooms and main entry. It should provide a sheltered space with protection from the sun and wind using a combination of natural shade, windbreaks and built elements. The central outdoor space must:

- 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 relationship to internal learning environments.

Outdoor learning environments must be integrated into the external landscaped area as well as being an integrated component of the total learning environment. Outdoor learning environments must 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 must be used to enhance the seasonal utility of these spaces, by providing shelter from prevailing winds, summer sun, and rain. Surfacing materials must be robust but offer areas of contrasting 'softer' feeling but durable materials such as synthetic turf. Areas of soft planting should be included but must be positioned appropriately and protected to enable the plants to thrive.

### 18.10.3. Hardcourts

The Contractor must 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) must 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 must 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 areas at least equivalent to the size of a single hard court;

The Contractor must provide hard courts and paved areas in accordance with the following requirements:

- the hard courts must be designed and line marked (2 contrasting colours) in accordance with competition guidelines for basketball and netball;
- the hard courts must 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.) must be provided to support basketball and netball;
- the hard courts will act as a recreation area at recess and lunch times and should be easily accessible from the Learning Community buildings and readily supervised by staff;
- the hard courts must 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 must 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 must not be placed in the shared run-off space between two adjacent hardcourts.

All hard court areas must incorporate a minimum 3.7m width obstruction free zone outside of the netball court perimeter.

### 18.10.4. Paved play areas

Additional linemarking for handball courts must be provided on the general paved areas.



# Education Directorate

## OUTPUT SPECIFICATION

*Sustainable Delivery of Public School Facilities Project*

**Volume 2 Part D –**

***Loose Furniture, Fittings and Equipment Specification***

***Project No 26243***

Version No.	Issue Date	Details	Author	Approved By
1.0				

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	Part A – Appendices
	Part B – Proposal Requirements
	Part B – Appendices
<b>Volume 2</b>	<b>Output Specification</b>
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	Part C – Technical Specification
	Part D – Loose Furniture, Fittings and Equipment 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 Volume 2: Part A – Functional Brief Section 7 for the project school type;
- be robust and of good quality, capable of meeting the requirements for the intended use; and
- 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 are encouraged. Where innovative solutions are proposed, the Contractor must demonstrate how the FF&E fulfils the functional requirements specified in Volume 2: Part A – Functional Brief Section 7 and Table 10.

Considered use of colour throughout spaces is encouraged. The Contractor is advised to read and respond to recent research<sup>1</sup> describing the aspects of the physical characteristics of learning spaces which have been shown to have a positive impact on academic performance in literacy and maths in Primary Schools. 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 effective ways to meet 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 and be approved by the Australasian Furnishing Research & Development Institute (AFRDI).

### 1.4. FF&E reference items

The FF&E Schedules provide examples of FF&E where that provides a clearer description of the project requirements. FF&E reference items are items specified by naming one or more 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.

### 1.5. School procured FF&E

The Directorate will manage a provisional sum for the purchase of some items of FF&E where the selection and quantity of items will be guided by input from the School. The items procured by the School include:

- musical instruments;

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<sup>1</sup> Barrett, P.B., Zhang, Y., Davies, F., Barrett, L. (2015) Clever Classrooms: Summary report of the HEAD Project (Holistic Evidence and Design) <http://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>

- loose sports equipment (class sets of racquets, bats, balls (etc.), parallel bars, vaulting horses, springboards, balance balls, gym mats, etc.);
- science equipment (including laboratory equipment, scales, laboratory glassware, laboratory tools (beaker and test tube tongs, rubber stoppers, test tube racks, etc.) chemicals and similar consumables, stands and clamps, microscopes, propagating trays for plants, aquaria, terraria and the like);
- storage (shelving or hanging space) for class sets of PPE (safety goggles, gloves, aprons or work coats) – applicable to science laboratories and materials technology work areas;
- materials technology equipment, including loose machinery and power tools, hand tools, 3D printers;
- homewares for locations where food is prepared and consumed (small appliances, crockery, glassware, cutlery, cooking equipment, cooking utensils, serving plates and platters, canisters, and the like);
- office equipment (including binding machines, laminating machines, stationary items);
- site maintenance equipment (hoses, sprinklers, lawn mowers, edge trimmers, blowers, garden tools, etc.); and
- multi-function (printer/ copier/ scanner) devices (which will be leased by the school).

The Contractor must consider this outline list of school procured equipment, and make provision in the design for custom storage suited to the various items in their quantities, shapes and sizes.

### 1.6. ITT devices

The Territory will provide all Interactive Teaching Technology (ITT) devices including mobile and fixed large format flat panel screens, Interactive Flat Panels, Interactive White Boards (for P-3 year levels), wall mounted ultra-short throw projectors, audio visual RGB projectors, display screens, etc. The Functional Brief provides details for the appropriate dimensions of AV displays (relative to audience size and location) to be factored into the design of learning settings and the placement of AV displays.

The Contractor is to allow for provision and fitting off of backbone cabling (power, ICT 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. Sheet linings (such as plasterboard or fibre cement) 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, maintain and replace proprietary lines of furniture products and furnishings items, and associated items of furniture and equipment to satisfy the requirements of the Functional Brief and as detailed in the 'Furniture' category of the Furniture, Fittings and Equipment Schedule as contained in Appendix E, Volume 2

Loose furniture is deemed to comprise furniture and/or other items that are not fixed into position and which are moveable to allow for adaptability of a space including:

- chairs, stools, cushions, bean bags and bench seating;
- desks and tables;
- mobile storage trolleys and mobile pedestals/drawer units; and
- waste paper bins and other standalone items, etc.

FF&E items must support a range of learning and teaching activities as described in Volume 2: Part A – Functional Brief Section 7 - Table 10. Some learning settings will be frequently re-configured to support changing learning modes through the school day and school week. FF&E in these spaces which support multiple uses need to be agile and adaptable.

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 or 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 learning and 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; and
- mobility.

At some 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. The design must allow for conveniently located, suitably sized storage for items of FF&E that are expected to be parked off the usable floor space or stored in cupboards when not needed in the learning settings.

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, compactus units, 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.

Where equipment requiring connection to power, telex, computer, telephone or the like services is shown on the Drawings or specified to be installed as part of the workstation system, the Contractor must make the necessary connections to the appropriate building service systems.

### 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:

Quality management certification:

- to AS/NZ ISO 9001

School furniture:

- AS/NZS ISO 4610.2 Furniture - School and educational – Part 2: Chairs
- AS/NZS ISO 4610.3 Furniture - School and educational – Part 3: Tables and storage furniture

Office furniture:

- AS/NZ ISO 4438 - Height adjustable swivel chairs
- AS/NZ ISO 4443 – Office Desks
- AS/NZ ISO 4688 - Fixed Height Seating
- AS/NZ ISO 4790 – Furniture – storage units
- AS/NZ ISO 5079 - Filing Cabinets (parts 1, 2 and 3) –

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

The Contractor must provide office chairs, workstation chairs, meeting room chairs, visitor chairs, student chairs, stools and soft seating and the like.

- 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. Without limitation, student seating provided by the Contractor will include the following seat types:
  - stackable, moulded polypropylene seat and back (integral one piece moulding or separate seat and back with foam or soft seating), 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.
  - tablet arm seats for spaces that need to be adapted readily for an explicit teaching or tutorial setting (noting inclusive provision – with a proportion having left handed tablets).
  - Student stools (for work surfaces higher than 720mm table-top) must be stackable powdercoated steel frame with sled base, horizontal foot-rail, and vinyl faced upholstered seat or moulded polypropylene seat.
  - Soft/ upholstered lounge style seating in learning settings in the Learning Communities and in the Library/Interactive Learning Resource Centre that are intended for reading and quiet discussion.
  - Bean bag style soft seating and/or large cushions.
  - Upholstered stools and benches in a variety of shapes, mounted on castors to facilitate easy movement.
  - Seating suited for activating external learning environments (which must be warranted for regular outdoor use and be UV stabilised).

### 2.4. Desks and tables

The Contractor must provide desks and tables that comply with the following requirements:

- Surfaces to be smooth, mid-range neutral in colour, non-reflective, matt or satin finish.

- Office desks 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. As a guide, a rectangular table of dimensions 800 x 2000mm can accommodate 6 students and can be arranged in pairs to create larger work surfaces. Other table configurations will be considered to suit the age, size and numbers of users, and the proposed fitout of the space. At least two of the tables provided for each space must be same table top dimension but with provision for adjustable height to suit wheelchair users. Table shapes and designs that facilitate different arrangements, and support multiple learning settings are preferred.
- Where the adult or senior student user is normally seated, work surfaces (e.g. work stations, desks, computer benches) must be 720mm above finished floor level.
- 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 single monitor arm firmly attached to the benchtop, and a below bench CPU cradle that can accommodate a variety of sizes of CPU.

## 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 must be no higher than 2100mm.

## 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 P-10 School or College. The bed(s) must have a powdercoat finish steel tubular frame with support slats, and a single solid foam or inner-spring mattress. Bed legs to have rubber stoppers or similar so that the floor finish is protected from damage.

## 2.7. Electric adjustable medical examination/ change tables

The Contractor must supply, install and maintain electric adjustable medical examination/ 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; and
- 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); and
- recycling bins (glass; aluminium, steel, plastics).

Where 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 the 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;
- Structural strength and quality of manufacture are key requirements, given that these devices will be moved around the facilities. Mobile whiteboards must be able to withstand frequent use and movement without losing rigidity; and
- 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 the 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 comms connection.

## 2.12. Mobile PA unit

The Contractor must provide a portable PA unit that meets the following requirements:

- PA unit must be held in a suitcase sized mobile metal framed case with integral retractable trolley, comprising:
  - 2 way speaker system delivering 120watts RMS, with integrated pre-amp, mixer and amplifier circuitry;
  - minimum 3 wireless microphone receivers;
  - provision of 3 battery powered wireless microphones;

- individual volume control for each microphone;
- AC/ DC operation with 2 built in re-chargeable batteries;
- tripod mounting, including provision of tripod; and
- integrated CD/ MP3/ USB player and digital recording.

### 3. Fittings

#### 3.1. Storage

##### 3.1.1. Library multi-media storage and display

The Contractor must provide an integrated storage and display solution for learning resources and wide variety of information media (including books large and small, DVDs, CDs, books on face display, etc.). The storage and display system must allow for simple adjustment and reconfiguration of shelving to allow for changing needs over time.

The storage may be modules of custom designed mobile joinery (on locking castors) to permit easy rearrangement of units, or be a proprietary modular steel library shelving system. Storage units must be stable and durable, with finishes that are suited to functional requirement. Shelving systems must be adjustable and support a variety of display modes. Shelves must be able to carry the weight of books and other media without deflection. Exposed metalwork must be powder coated.

##### 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 lock 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 personal effects storage

Where storage for students' personal effects is provided to meet the requirements of the 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;
- compartments being of 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; and
- 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 locker for all students in Year 7 and above.

Lockers must be:

- of a robust manufacture, including a fixed internal shelf;
- finished to all surfaces with facing materials that are easily cleaned, and resistant to scratching and defacement;
- lockable by means of padlocks;
- identified by a unique number signplate screw fixed to the locker door or case;
- suitable size to store school bags and notebook computers, etc.;
- stacked to a maximum of two, with a maximum height 1200mm (nominal 600mm each);
- able to be secured in location, to prevent movement during use; and

- 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 the 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;
- hinged lockable doors with latch and padlock facility;
- ventilation perforations to the door panel; and
- provided with internal hanging rail with coat hooks plus fixed shelf.

### 3.5. Mobile storage units

Mobile storage units, to complement fixed storage, are desirable forms 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. This approach ensures maximum adaptability of a learning space when it is intended to have multiple functions. Larger units (able to be moved by two adults) can be used as temporary dividers to create learning settings. General requirements for mobile storage units include:

- Small units (single person movement) – nominal 900mm height, wipe down fixed top panel, rigid powdercoat finish metal frame with dividers and single stack of removable polycarbonate storage trays, castor wheels with locking mechanism;
- Larger units – refer Technical Spec – 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 kickrail, fixed top and bottom shelf and 3 or 4 adjustable intermediate shelves.

### 3.7. Sundry Fittings

Where necessary to deliver or compliment the required functionality, the Contractor must provide sundry fixtures and fittings, including:

#### 3.7.1. Key storage cabinet

The Contractor must provide key storage cabinet, heavy duty steel construction, with a resettable digital lock. Size to accommodate the number of individual key sets required for the School (nominal 60 keys or 120 keys).

#### 3.7.2. First Aid cabinets

The Contractor must provide a proprietary wall hung metal or PVC case first aid cabinet in each Sick Bay 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 Section 12 of the ACT Education document “Health and Safety Policy – First Aid” (FAP2003 – or 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 Multiple Purpose Hall, science preparation rooms, materials technology workshops, etc.) or where listed as require in the Functional Brief. Size of these additional first aid cabinets must be based on the briefed or likely user numbers in the space or functional area.

#### 3.7.3. Sharps container

The School will have limited requirement for sharps disposal. The Sick Bayroom must be provided with a 2L size sealable sharps container, labelled with use and safety instructions, and suitable for placement on a bench or tabletop.

### 3.7.4. Chemical storage cabinets

When required by the Functional Brief, 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. Flammable materials storage cabinets

When required by the Functional Brief, the Contractor must provide floor mounted, lockable metal storage cabinets, rated for storage of flammable materials.

### 3.7.6. Nappy change bench

Where briefed or required for the reasonable functioning of the facility, provide a nappy changing station that complies with BCA 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; and
- fitted with adjustable safety belt.

## 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:

Multipurpose Hall:

- 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 volleyball, and goal posts and rings for netball (where courts are sized for this sport); and
- 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 to steel goal posts (to 1800mm above pavement level), installed with Velcro straps;
- Australian Rules football goal and point posts;
- Football (soccer) goal frames and nets; 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 gas 4 burner cooktop, griller and electric oven. Fold down door to oven. Removable enamelled trivets to each of the gas burners. 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:** Inset, self rimming, stainless steel finish, with front or side controls and piezo ignition. Cooktops must have a minimum of 4 burners, with removable enamelled trivets to each burner, and a cooktop surface designed to contain liquids.

**Microwave ovens:** Provide programmable multi-function domestic microwave ovens (in Staff Lounge, Canteen, Food Technology kitchens, College Student Lounge, Community Multipurpose space, and other locations as identified in the 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. Fitted installation must include provision of ventilation as recommended by the appliance manufacturer. The microwave must be installed at bench height or to a maximum height of 1500mm above floor level.

#### 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 staff lunch rooms, 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.

#### 4.1.4. Chilled water units

The Contractor must 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 can be via a single post dispenser.

#### 4.1.5. Dishwashers

Domestic Dishwasher:

The Contractor must 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; and
- façade panel and door panel that can be integrated with joinery and décor.

Commercial dishwasher:

The Contractor must provide an underbench 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; and
- 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 food service 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; and
- 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 sales counters may be open to external spaces, 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 School play equipment provision

The Contractor must provide installed play equipment in Primary schools to meet the specific functional requirements, listed in Volume 2: Part A – Functional Brief Section 7 for external learning. 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, enjoyment and a sense of challenge, applicable to the respective age groups.

Play equipment must offer multiple modes of play that are age/stage appropriate. Equipment must promote a range of physical movements and challenges including:

- slides;
- sprung equipment (e.g.: spring animals for F-2 years);
- angled or vertical poles;

- scramble nets;
- bridges;
- climbing frames;
- stepped decks;
- monkey bars; and
- balance beams

In F-2, where possible build in items that stimulate imaginative games and role playing such as:

- steering wheel panel; and
- shop front window.

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; and
- 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 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 clay pug 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; and
- provide with clip-on seat (stainless steel frame and padded seat).

#### 4.4.4. Materials technology workbench

A four person materials technology work station, 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), and 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.

#### 4.4.5. Flame cutting and welding bench

A steel construction bench purpose designed to support safe flame cutting and welding activities. 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; and
- 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.