Te Tāhuhu o te Mātauranga
Ministry of Education

Te Kāwanatanga o Aotearoa
New Zealand Government

# Designing Schools in Aotearoa New Zealand

## School Property Design Standards

October 2025

# Contents



Cover photo credit: Virginia Woolf

# Foreword

This document also takes in learnings from past projects, school property experts, hundreds of design review discussions, and a greater understanding of what is important for our ākonga and communities.

It is critical that we provide property that allows our schools and communities to inspire ākonga curiosity and learning, support wellbeing and build lifelong memories. To do this, we encourage you to consider property through the minds of our learners, including our most vulnerable. Ākonga must be central to everything we do.

We are here as guardians/kaitiaki of these important social assets. We are committed to sustainable outcomes, ensuring our schools remain quality social assets for generations to come. To do this, we must aim to ensure school property decisions are sustainable and prioritise long-term outcomes.

We hope this document provides you with a strengthened understanding of what our priorities are for school property. Thank you for being a part of our journey.

# Document History

| Revision Date | |
|---|---|
| **October 2025** | **Some general edits including:**<br>• Lifts – earlier amendment included<br>• Ceiling heights<br>• Balustrade and handrails |

# Introduction

Schools are valuable, long-lived social assets. They have given access to education, and inspiration, for generations of ākonga to learn and succeed.

## Context

Schools are valuable, long-lived social assets. They have given access to education, and inspiration, for generations of ākonga to learn and succeed.

The Ministry of Education's (the Ministry's) purpose is to shape an education system that delivers equitable and excellent outcomes. Schools must also meet a range of social, cultural, environmental, and economic priorities for the benefit of ākonga, whānau, communities and government. Schools are important to their local communities. They can be sites of cultural significance to local iwi/ and hapū, community facilities and social meeting places, and they are often a source of community pride.

We must sustain and enhance the quality of schools for current and future generations. This requires us to be effective stewards of school property.

School property plays a key part in providing a quality environment for learning and for communities. Our assets need the flexibility to support a wide range of users. Our assets must be fit-for-purpose and sustainable for future generations to come. From the perspective of the Ministry as a large portfolio asset owner, it is also important to us that our property is easy to manage and maintain.

In the context of this document, the term 'Ministry' generally refers to the Ministry's infrastructure and digital/ Te Puna Hananga Matahiko group.

## Purpose of the DSNZ

The purpose of the DSNZ is to help the Ministry with its kaitiakitanga/stewardship role. This means/ involves ensuring quality school property outcomes for the enduring benefit of all learners and their whānau, teachers and school leaders, and local communities.

The Ministry does this by establishing education specific standards and guidelines, alongside the New Zealand Building Code (NZBC) and industry best practices, to support a wide range of educational and sustainable property objectives.

DSNZ answers the question 'What standards must you meet when designing or planning to do work in a school?'

### DSNZ is Part of a Wider Suite of Design Standards

The DSNZ is the principal document in a suite of design standard and guideline documents aimed at providing clear Ministry expectations for project teams and people involved in the planning and design of schools.

The full suite of standards and guideline documents can be accessed from the property pages of our website.

## How DSNZ Standards Fit in with Broader Ministry Design Requirements

The DSNZ standards form one aspect of the Ministry's design requirements. These can be broadly split into the following areas:

### Design Standards

These are the objectives set out in the DSNZ and the Ministry's overall suite of design standard documents

### Design Process Requirements

These are the Ministry-specific processes that project teams are expected to follow when designing schools. These requirements largely cover how we want you to go about the planning and design process. An example of this is submitting specific documentation for a design review.

**Design Compliance Verification**

This refers to documentation that demonstrates compliance, or non-compliance, with our design standards. An example of this is providing a daylighting report.

Project teams involved in the planning and design of schools must be familiar with the Ministry's design standards and requirements.
This information is available on the property pages of our website or can be provided by a Ministry team member.

## Scope of the DSNZ

All work on school property is expected to comply with legislative requirements and best practices as well as the Ministry's requirements.

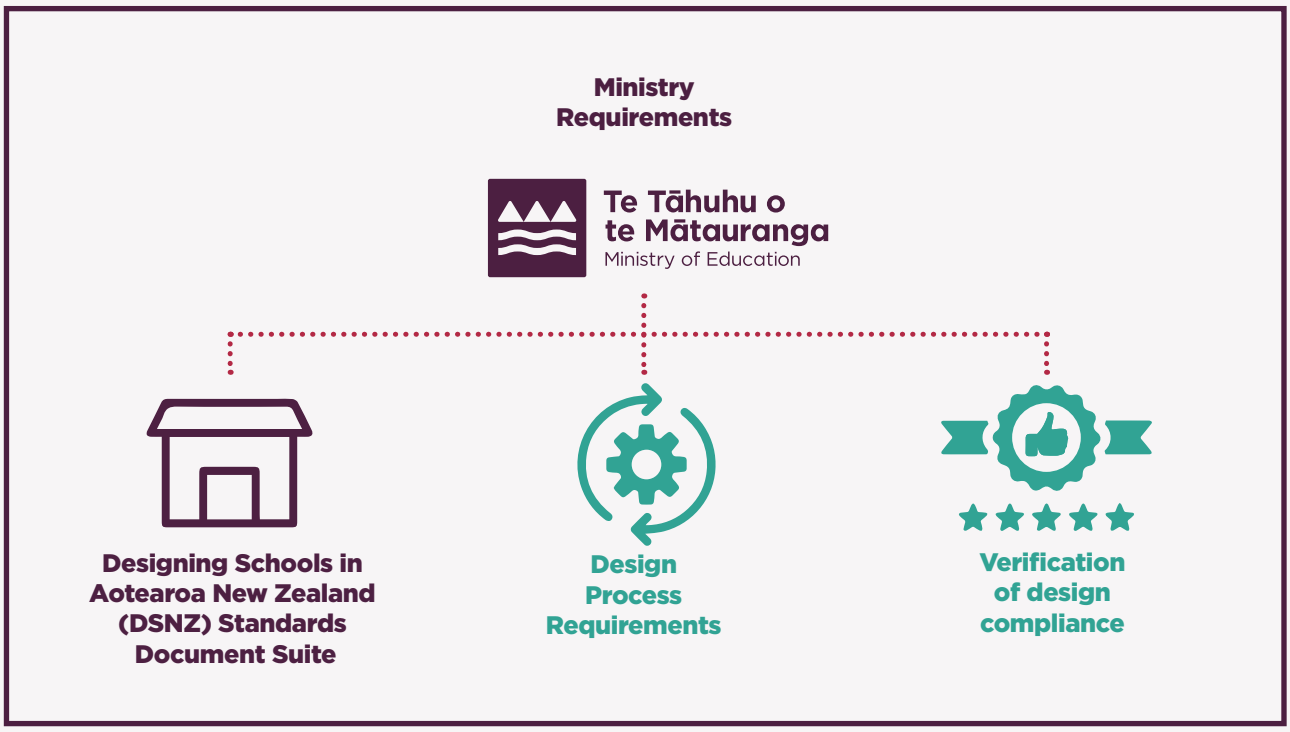
Adherence to the Ministry's design principles and standards is mandatory for all new work on state school property that learners may use. This applies regardless of who owns the property or funds a project.

School or community projects not intended to be used for learning must meet DSNZ site planning priorities and standards and be approved by the Ministry. A school or community project must not impact on the potential for, or quality of, future development of a school.

**Maintenance and Refurbishment**

Maintenance, refurbishments and remediation works must meet our requirements as near as reasonably practical, and endeavour to meet all principles.

Projects on existing property must consider all Ministry requirements, to ensure an appropriate scope of work is considered to avoid the issues of missed opportunities to upgrade or abortive works. Significant replacement or upgrades to existing buildings are not expected to be carried out unless for good reasons. Retrofit or upgrade solutions must provide tangible value-for-money benefits for the Ministry and the school. In other words, if it is not broken and has performed reasonably, it may not make sense to upgrade to new build standards.



When evaluating a retrofit or refurbishment project, consider:

- the building's age and expected remaining life
- what is necessary for the building to be functional and durable
- whether meeting new build standards will offer tangible benefits
- the law of diminishing returns — avoid costly upgrades that offer little benefit, and include upgrades that are low cost, high benefit.

**Departures from Ministry Standards**

We acknowledge that some schools have significant constraints, and meeting principles and requirements may not be feasible in some circumstances. If you are delivering a project where it doesn't make sense, to you, to meet our new build standards you must let us know the cost-benefit between options. Any departure from mandatory requirements standards and priorities must be approved by Ministry management via Design.Assurance@education.govt.nz.

**Who Needs to Understand Ministry Standards**

Designers, engineers and project teams must clearly understand all relevant Ministry standards before undertaking school projects. However, everyone involved in the planning and delivery of projects in schools, especially decision makers and approvers, should understand our design principles and have a high-level understanding of our standards. The standards are available on the Ministry website or from a Ministry team member.

**Education Design Capability**

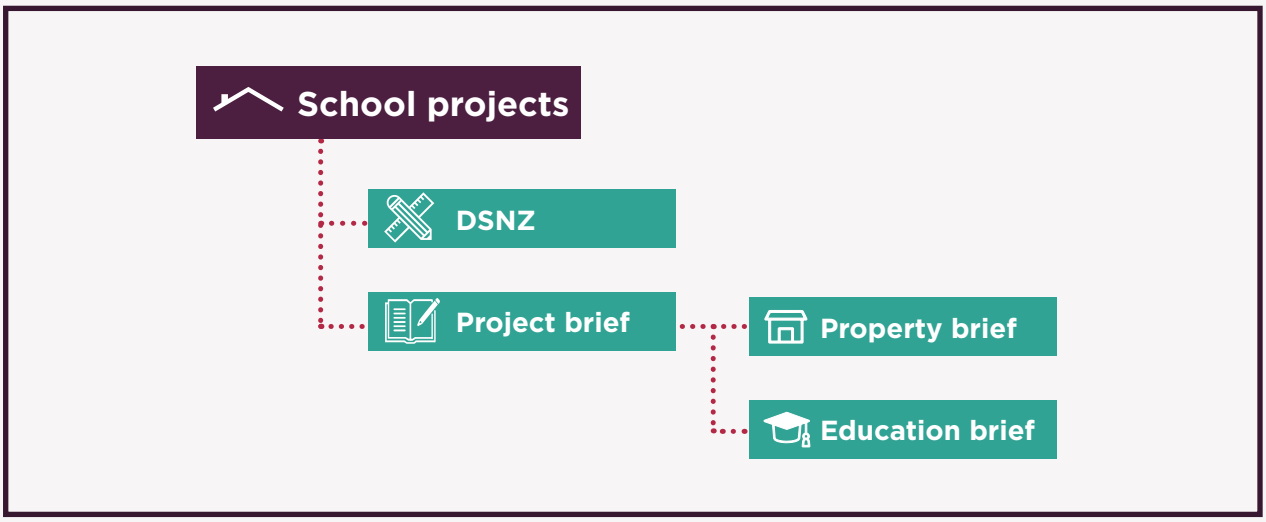
Education design is a specialised skill; and designers must have up-to-date knowledge in education design at an appropriate level for their project. Our designing schools web pages have some information for you, but we encourage developing capability through accessing widely available education design resources in New Zealand and overseas.

## Project and Education Briefs

Planning and design must support a school's educational and cultural briefs as well as Ministry property requirements. Project teams must develop solutions that support a school's educational needs within the constraints of Ministry property standards and a project's outlined scope of work. In other words, a project's agreed scope must be delivered to our standards.

A project brief is prepared by the Ministry and is customised for each project. It sets out the project team's scope of work and the project's requirements. A project brief is supported by a school's education brief.

The design team must develop solutions that support a school's educational needs but also meet Ministry standards. At times, this will require design teams to explore solutions that vary from a school's initial preferences.



### Precedence of Documents

Should ambiguity or conflict occur between DSNZ standards and a project brief, or an earlier (dated) Ministry design standard, DSNZ takes precedence.

## Outcome-based Approach to Design Standards

As much as practical, Ministry standards are performance-based or function-focused outcomes. The intent of this outcome-based approach is to:

- provide design teams and decision makers with a strong understanding of our intent and priorities, and
- allow design teams and decision makers to evaluate whether a design outcome, or solution, has reasonably achieved an objective.

Table 1 explains the key terms used throughout this document and outlines the expected approach for each term.

### Preferred Solutions and Prescriptive Standards

Throughout DSNZ there are prescriptive standards, or as well as solutions that are identified as a ‘preference’. A preference is a solution that achieves our performance expectations most of the time. This can offer simplicity for project teams and a high degree of consistency across the Ministry asset portfolio.

Project teams must be outcome-focused. It is expected that design teams will evaluate a preferred solution or prescriptive standard holistically against our principles and overall expected outcomes for learners and Ministry assets. Neither a preferred solution nor a prescriptive standard should be used if these would lead to detrimental outcomes for learners or Ministry assets.

## Table 1: Terminology used in Ministry design standards

| Example Terms Used | Expectation for Project Teams |
|---|---|
| **Ensure, must, provide, are to, is to** | A designer must meet these standards. |
| **Maximise, minimise** | The use of maximise and minimise is generally focused on areas where flexibility is needed but there is a primary aim of prioritising learners, being efficient with design, or improving sustainability or cost outcomes.<br>A project team must make every effort to achieve the desired outcome of maximising or minimising within a project's constraints, considering costs versus benefits.<br>Any departure from achieving these objectives should be supported by a reasonable rationale. |
| **Avoid** | Avoid unless a project has legitimate unresolvable constraints or no valid alternative solution. |
| **Prioritise** | A project team must put these standards ahead of other standards, unless detrimental to the asset or learners. |
| **Recommended** | A recommended starting point or maximum. A project team must still evaluate whether an outcome is fit-for-purpose. Project teams should have a sound rationale for any outcomes outside recommended limits. |
| **Preference, should** | These terms outline a preferred solution from an asset management or educational perspective but acknowledge that these solutions may not always be appropriate in some contexts.<br>Our identified preferred solutions, or preferences, must be used unless they would result in poor learner or asset outcomes, or there are unresolvable constraints. If a preference is not met, project teams must still achieve overall functional objectives using an 'alternative solution' approach. |
| **Consider, discuss, explore** | Ensure that the project team has thought about, engaged with and discussed key points with stakeholders prior to progressing a plan or design. |

## Structure of this Document

This DSNZ document consists of three separate sections.

1. **Design Principles**

This section outlines the overarching principles that guide our design standards and guidelines.

2. **Site and Building Spatial Planning Standards**
   This section provides design spatial planning standards for school sites and buildings.
3. **Technical Standards**

This section provides design standards for the technical aspects of school sites and buildings.

### Future DSNZ Versions

It is planned to release a version of DSNZ in the not-too-distant future. This version will include:

- refinement of some standards as we learn more from research and standardization.
- updates based on user feedback and lessons learned from this version
- a fourth section referencing material and component standards.

  *Note; this version contains some references to building component standards where it is helpful for document coherence, or to support asset management priorities.*

## Feedback and Updates

We regularly review our documents to improve the content and ensure alignment with our objectives. If anything appears to be unclear or inaccurate, please share your feedback and comments with us through school.design@education.govt.nz.

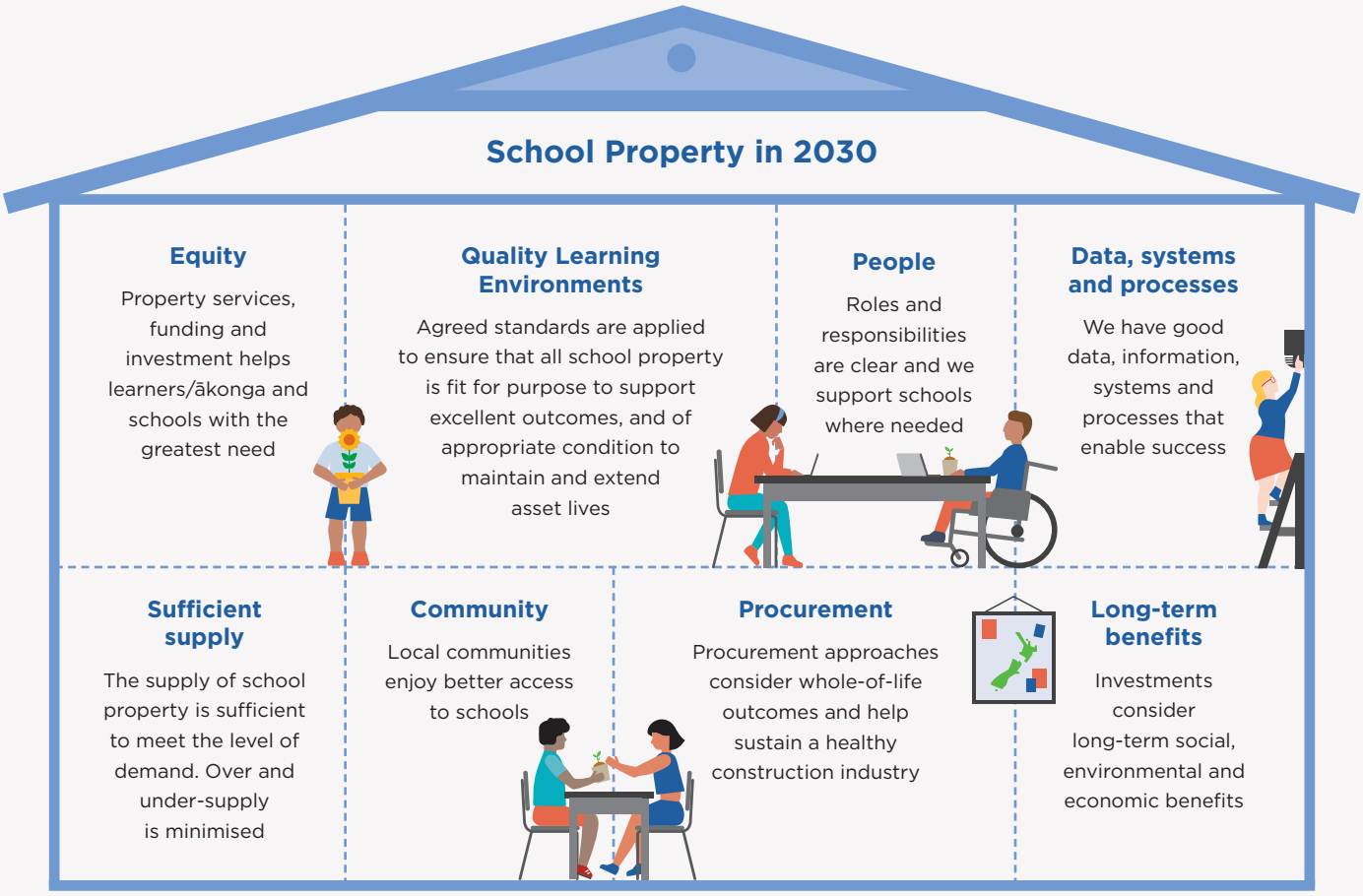
Your feedback will help us to ensure our documents remain a valuable resource for those who plan and design our schools.

# Te Rautaki Rawa Kura – The School Property Strategy 2030

## The School Property Strategy continues the Ministry's progress towards a more strategic, portfolio-wide approach to managing school property. This strategy supports the following outcomes:

- All schools will have quality learning environments that reflect agreed standards of condition, fitness for purpose and operational efficiency. These will better support teaching and learning and help to maintain the portfolio for the long term.
- The Ministry will be making better use of school property by reducing our environmental impact and supporting access to local communities.
- The portfolio will be better utilised and we will be working well across government to meet demographic and social challenges.
- We will be working better with the construction industry to help it sustain jobs and develop skills.
- The management of school property will be more consistently carried out, providing more timely and effective maintenance and with less of a burden falling on schools.

The full School Property Strategy 2030 document is available on our website.



## Our school property vision

**All schools will have quality learning environments as part of a well-managed and sustainable portfolio that helps deliver equitable and excellent outcomes for every learner.**

*Ka whai horopaki ako kounga tiketike ngā kura katoa, ā, hei wāhanga nui tēnei o tētahi rārangi puritanga toitū e tino tika ana ōna whakahaere, hei āwhina i te horanga o ngā putanga ōrite, hira hoki mō ngā tamariki katoa.*

### The four strategic objectives

The objectives aim to improve the quality of school property and the system of property management and to sustain the portfolio to deliver greater value for money in the long term. The vision and the four strategic objectives will help us to achieve the Ministry's strategic priorities.

**Quality Learning Environments**

School property meets agreed standards to support learners/ākonga and teachers to succeed.

*Ngā horopaki ako kounga tiketike ka tutuki i ngā rawa kura ngā paerewa i āta whakaaetia e tika ana kia tino eke ai ngā ākonga me ngā kaiako ki te taumata.*

**Sustainable Portfolio**

Policies, planning and investment optimise long-term social, environmental and economic benefits.

*He rārangi puritanga toitū ka whakaranea ngā kaupapa here, ngā mahi whakamahere, me te haumitanga i ngā huanga ā-pāpori, ā-taiao, ā-ōhanga wā roa.*

**Well-Managed Property**

Everyone knows their role in managing school property and is supported to deliver their part.

*He rawa e tino tika ana ōna whakahaere kei te mārama ngā tāngata katoa ki ō rātou tūnga i te whakahaere rawa kura, a, he pai te tautoko i a rātou.*

**Equitable Outcomes**

Diversity is recognised, and schools and learners/ākonga with the greatest needs are prioritised.

*He putanga ōrite e whakamihia ana te kanorau, ā, ka meatia ngā kura me ngā ākonga e tika ana kia āwhinatia nuitia hei aroākapa.*

# 1 Design Principles for School Property

## 1.1 Introduction

These design principles provide the overarching priorities for school property and inform our detailed design standards and guidelines outlined throughout our documents.

The intention of making these principles explicit is to:

- provide a clear understanding of our priorities
- provide a basis for the development of specific design standards
- support the evaluation of design, and
- support decision making when a preferred outcome cannot be achieved due to constraints.

## 1.2 School Design Principles

The following design principles outline the Ministry's overarching objectives for school property projects. These principles must be achieved and should be referred to often when making design decisions. Schools must be:

- functional
- responsive, and
- sustainable.

### Functional

Schools are primarily places for teaching and learning. Functional schools support ākonga on their educational journey by having the following features:

**Learner-centred**

- Functional schools celebrate and prioritise ākonga by maximising facilities and spaces for learners and learning activities throughout school property.
- They include spaces that enable agency and opportunities for learners to initiate and manage their own learning.
- Ākonga are involved in the planning of their spaces.

**Connected**

- Connected schools are compact, with learning facilities in close proximity to each other.
- School design prioritises mutually beneficial, adjacencies and connections to maximise opportunities for teaching, learning, and other activities.
- Functional schools maximise physical and visual connectivity throughout the school grounds and buildings.
- Connected schools have quality links to the natural environment and their wider surroundings.

**Coherent**

- Functional schools are purposeful, well-organised, and highly usable.

**Easy to Operate**

- Functional schools make day-to-day use and maintenance easy and simple.

## Responsive

The school property portfolio aims to help deliver equitable and excellent outcomes for every child. School property must be designed to be warm, dry, safe and accessible – in a way that provides an inclusive and barrier-free environment. Responsive schools are:

**Consistent with the Principles of Te Tiriti o Waitangi**

- They enable ākonga, whānau and community to authentically engage and participate in local tikanga, mātauranga Māori, and te ao Māori.
- Design supports te ao Māori values and celebrates cultural activities and spaces within the school.

**Equitable for All Learners**

- Responsive schools are designed to support inclusive, barrier-free access for their diverse range of users.
- Schools follow universal design principles to provide equitable access, dignity and respect for all school users.

**Supportive of Wellbeing**

- School design prioritises wellbeing and promotes a sense of support and safety for all users, especially our most vulnerable.
- Responsive schools promote positive social behaviour and minimises opportunities for negative behaviour.

**Welcoming and Inclusive**

- Welcoming schools enable whānau and communities to easily engage and connect with a school.
- Inclusive schools promote a sense of place, inclusion and belonging for all.
- Welcoming schools align with whanaungatanga and manaakitanga values.

**Safe**

- Schools are safe throughout an asset's life cycle. People are safe when property work is being carried out, and schools are safe to use and occupy for all.

**Fit-for-purpose**

- School property is first and foremost designed to facilitate quality teaching and learning.

**Flexible**

- Property should provide reasonable flexibility to support a range of teaching and learning approaches and activities.
- Flexible schools maximise multi-use spaces and minimise single-use spaces for maximum utility and flexibility.

## Sustainable

Schools are long-term social assets. The size and scale of the school property portfolio means we can make real change in the environmental impact of our schools. It is important that school property can change and adapt to support changes in practices with minimal impact on the environment. Sustainable schools are:

**Environmentally Conscious**

- They are designed to minimise their whole-of-life environmental impact.
- They enable sustainable learning by providing opportunities to develop environmental awareness and understanding.
- Sustainable schools align with kaitiakitanga and wairuatanga values.

**Economical**

- Sustainable schools are designed to minimise the cost of maintenance and operations.

**Resilient**

- Sustainable schools are resilient and durable.

**Adaptable**

- Schools can cater for possible future changes in roll.
- Their design maximises adaptability and versatility over the life of the asset
- Adaptable buildings can be repurposed or reconfigured with minimal alteration to structures, enclosures or infrastructure.
- Adaptable schools reasonably support future changes in curriculum delivery or teaching practices.

## 1.3 Design Process Principles

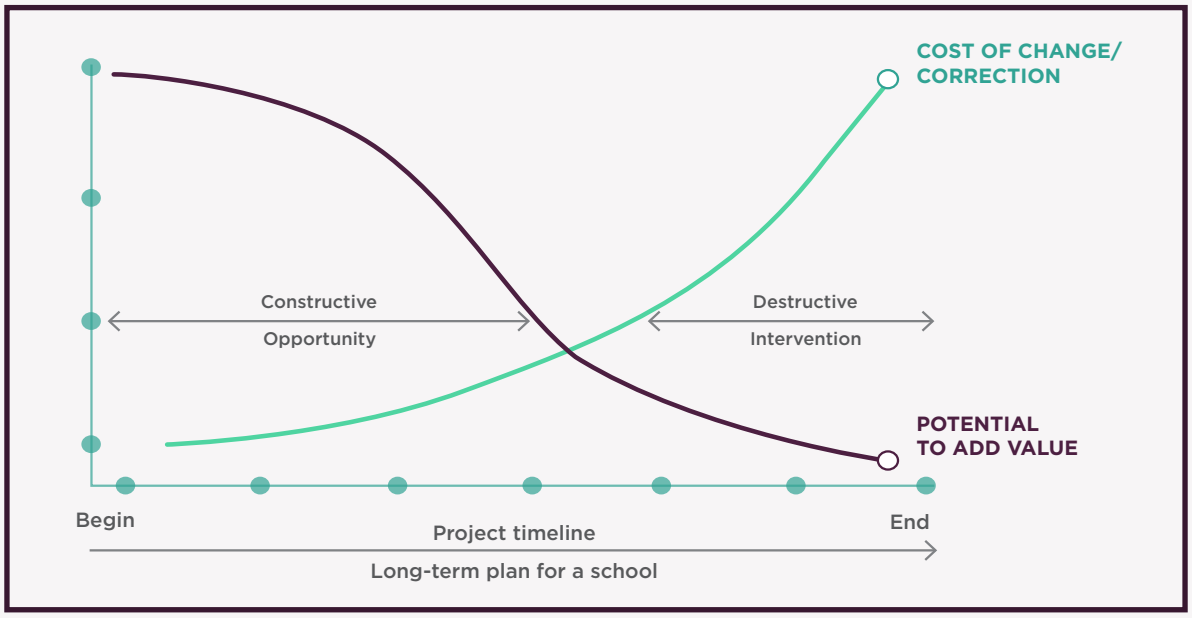
The project design process will be largely led by the Ministry, with Standard Planning and Standard buildings being the first option. There may be times where a site-specific building design is required, typically in complex constrained sites.

Project teams are expected to follow a best practice design process when working on school property projects. The following principles are especially important to us, and must be central to planning and decision making:

### 1.3.1 Investigate and Plan Early in the Project

Project teams must gather important information, investigate and analyse early in a project to support improved outcomes and timelines.

One of the biggest lessons learned from recent school projects is the benefit of early investigation and analysis. Doing investigations and analysis late in a project can lead to costly reworking and/or poor outcomes.




### 1.3.2 Collaborate Widely and Early

Project teams must collaborate widely with stakeholders and consultants early and throughout a project for improved coordinated outcomes. Remember: *Everyone together, discussing everything, early.*

### 1.3.3 Analyse Options

Evaluate design options before arriving at a solution. Avoid accepting a solution before investigation and option analysis have been carried out.

**Step through Design Solutions**

Explore preferred systems or solutions first, before rejecting them and moving to more costly, less sustainable or complex options.

### 1.3.4 Prioritise Sustainable Outcomes

Prioritise and maximise passive design solutions before considering active engineered solutions.

**Maximise passive response before developing an engineered solution**

### 1.3.5 Optimise Engineered Solutions

To reduce the carbon impact and achieve sustainable outcomes, design teams must optimise solutions. Provide engineered solutions that are no more than necessary to achieve Ministry performance standards. Avoid high-cost or high-carbon solutions that exceed our performance standards.

## An example of stepping through options to optimise selection of a foundation

# 2 Spatial Planning for School Property

## 2.1 Introduction

The design of a school site is a key aspect in creating a quality learning environment and school-wide learning opportunities for ākonga. Considered placement of buildings, infrastructure, and the design of outdoor spaces is fundamental to achieving our overall school property objectives.

Site and building planning must enable a school to deliver their curriculum and support their practices. Planning must also consider a school's future educational needs, Ministry asset priorities and the preservation of school property over the long term.

This section sets out site and building spatial planning standards and guidelines that support our school design principles.

### 2.1.1 Long-term Planning

If a school does not have a long-term property plan, there must be some planning to ensure that any immediate property project adequately considers quality long-term outcomes for the specific school. Any planning needs to conform with Ministry school-site planning priorities.

The Ministry uses various approaches to long-term planning, including Masterplan, bulk and location, school property plan. All of these inform a long-term plan for a school. When referring to any these practices in this document, we will use a generic term of 'long-term plan'.

Regardless of a project's scale, or who funds it, planning must preserve the long-term coherence and quality of the whole site.

## 2.2 School Site Planning Priorities

Along with the overarching school design principles outlined in Section 1, the following priorities must be factored in when creating long-term plans or undertaking new work on school sites.

### 2.2.1 Contextual Setting

School design must prioritise the needs of a school as a learning facility, while also respecting the environmental and neighbourhood context. Schools must strongly connect with the community and local surroundings. Design teams must:

- explore opportunities to connect with the physical and natural surroundings
- ensure the appearance of school buildings is appropriate — consider urban design principles, civic presence, building scale and proportion, form, visual balance, materials, and colour
- aim to reinforce and support a sense of belonging for learners
- promote delight and inspiration for learners, teachers and the community
- consider:
  - local, cultural and historical narratives
  - a school's context when locating buildings, infrastructure, and outdoor spaces
  - the temporal and environmental impacts on neighbours.

### 2.2.2 Connect with the Community

Schools should reflect the school, local community, mana whenua and tangata whenua. Facilities that have cultural or community uses must be adjacent to the main public entry points of a school.

Site planning must promote community engagement and support schools to connect with whānau and community. Maximise opportunities for quality physical and visual connection into the school grounds.

### 2.2.3 Preserve Space for the Future

Planning for buildings, outdoor spaces and infrastructure must consider future property needs for possible roll growth.

Designers must create compact, connected schools that use space efficiently and purposefully within a school site regardless of the space available. Ensure design supports:

- the ability to add property for unforeseen growth beyond a school's Masterplan roll projection, and
- compact and efficient occupation of land.

### 2.2.4 Maximise Usable Outdoor Space for Learners

Outdoor space is part of a quality learning environment, an important learning resource, greenspace, wellbeing and recreation. Plan to maximise usable outdoor space. If a site is constrained, strategies must be employed to protect usable space.

## Table 2: Calculating usable outdoor area per learner for a Masterplan roll

| Step | Action |
|---|---|
| 1 | Determine the Masterplan roll ('s'). |
| 2 | Measure a site's total usable outdoor area ('a').<br>*Do not include area that cannot be used for infrastructure or learners. For example, dense bush, steep banks etc. Be practical when assessing the percentage of actual area within planted areas that are accessed by learners.* |
| 3* | Determine the infrastructure footprint* ('i'), using the most accurate method available:<br>(a) Calculate the gross property footprint for the Masterplan roll, using our property calculator. Add an appropriate area estimate for vehicle, ancillary facilities and other site infrastructure, or<br>(b) Measure actual existing building footprints and infrastructure on-site, adding any proposed future new building or infrastructure footprints.<br>*Ensure footprint calculations account for multilevel buildings if they are being considered. |
| 5 | Calculate the usable outdoor area per learner ($m^2$) = '(a – i)/ s'. |
| 5 | Identify social/passive recreation space ($m^2$) separately from active recreation space ($m^2$). |

## Table 3: Site planning strategy based on usable outdoor area

| Usable area per learner | | Required design approach |
|---|---|---|
| Secondary schools and schools with fewer than 300 learners: **>40m²/learner** | | Follow best practice in site planning. |
| All other schools: **>30m²/learner** | | |
| 'Constrained' | Secondary schools and schools with fewer than 300 learners: **20-40m²/learner** | As above, plus ensure space preservation measures to protect outdoor space and long-term future flexibility. |
| | All other schools: **>30m²/learner** | |
| 'Highly constrained' | **<20m²/learner** | As above, plus explore increasing indoor and outdoor space amenity. |

The area per learner categories do not define minimum allowable areas and do not apply to all schools. They are to assist with property planning decisions only.

**Space for Learning and Passive Recreation is a Priority**

Area for outdoor learning and passive recreation takes priority over active recreation space. Adequate space for year-round passive recreation must be provided. As a guideline, provide a minimum of 10m$^2$/learner for usable passive recreation space.

Designers must still provide some green space for active recreation unless instructed otherwise by the Ministry. Priority must be for active recreation space to support sports-field dimensions.

**Example Strategies to Preserve Outdoor Space**

- Explore multilevel buildings.
- Preserve usable outdoor area and green space through compact, rational planning of buildings.
- Reduce the impact of car parking and infrastructure.

**Example Strategies to Increase the Amenity and Quality of a School**

- Explore off-site opportunities to use other facilities for physical education or active recreation.
- Convert unusable space into usable space.
- Increase year-round all-weather usability of outdoor spaces.
- Design indoor space to be usable for passive recreation and social activities.

### 2.2.5 Connected Learning

Facility locations must generate compact, fit-for-purpose, coherent and functional schools.

Maximise adjacencies and connectedness to improve the flexibility of space for multiple uses, connectedness between teaching spaces and the adaptability of facilities.

### 2.2.6 Inclusive Planning

Ensure site planning prioritises inclusive, barrier-free access to learning and recreation.

### 2.2.7 Minimise Travel Distances

Travel times must support the principles of equitable, functional, and connected schools.

All efforts must be made to minimise travel times across schools and provide a compact learning campus regardless of the space available. Travel times are to be minimised on a site. Learners and staff must be able to travel between spaces in a reasonable length of time. For secondary schools, travel times must be less than the time between classes and must not impact on the ability to have meaningful scheduled breaks.

The maximum distances in table 4 below should not be seen as targets to achieve for a school site. These figures are primarily to provide upper-level parameters to inform the planning decisions of large schools, where there are significant existing constraints.

Alongside distance, other factors to consider are:

- learner ages
- disabilities that impact mobility
- climate, and extended exposure to the elements
- terrain and slope impact on disabled users.

Table 4: Measuring travel distances between facilities

| User | What to measure |
|---|---|
| Staff and learners | Greatest distances between key teaching spaces and core facilities, such as library, hall, gym, admin, pick-up/drop-off areas. |
| Staff | From car parking to admin, staffroom to teaching spaces. |

Table 5: Maximum travel distances

| School type | Preferred (maximum) travel distance between key facilities |
|---|---|
| Primary school | 80 (120m) |
| Secondary school (<1000 learners), kura or composite school | 100 (150m) |
| large secondary school with >1000 learners | 150 (250m) |

#### 2.2.8 Climatically Pleasant Outdoor Spaces

Key outdoor spaces need to be comfortable and pleasant, offering adequate shelter from rain, wind and excess sun. Avoid learner spaces exposed to prevailing winds and winter shade.

Ensure buildings are placed and oriented to minimise the negative effects of wind and shadowing on outdoor spaces, prioritising morning and lunchtime periods. Pay particular attention to multilevel buildings and consider the effect of shadows on key spaces throughout the school year.

Prioritise outdoor spaces for learning and recreation to the north of buildings.

Ensure the effects of wind acceleration around entry ways and learning and gathering areas are mitigated.

#### 2.2.9 Multifunctional Outdoor Spaces

Design outdoor spaces to be multifunctional, accommodating a wide range of activities. Minimise bespoke, single-purpose spaces.

Designers must evaluate a design proposal against the range of activities that are likely to be undertaken by the various groups of school users.

#### 2.2.10 Create Zones

Look to create 'zones' and a range of intimate outdoor spaces within schools. This is especially important for large schools and schools with wide age ranges. Create spaces that promote:

- play, exploration, inspiration, social interaction
- placemaking for various activities, a sense of belonging and degrees of scale.

Disproportionately large central courtyards are to be avoided. Designers must apply best practice urban design principles when placing buildings and considering outdoor space.

#### 2.2.11 Safe Sites

Design school sites for people to feel safe and to minimise antisocial behaviour. Embed passive surveillance principles through the site. Implement the principles of Crime Prevention Through Environmental Design (CPTED) and Safety in Design, with a focus on principles of activating space, and providing high quality passive oversight.

Maximise outdoor space that has quality passive oversight and promotes wide use by learners and the community.

#### 2.2.12 Sustainable Planning

Plan school sites to minimise environmental impact and enhance sustainability learning opportunities.

#### 2.2.13 Provision for Growth

Ensure to create compact, efficient schools.

### 2.3 Detailed Site Planning

For holistic, purposeful planning, design teams must understand and consider the urban context, environmental conditions and vision of a school. Analysis must consider both current and future requirements (summarised in the table below).

Table 6: Detailed planning considerations

| Built environment | Natural environment | School and community |
|---|---|---|
| • Existing facilities<br>• Site infrastructure<br>• Transport network<br>• Local context and neighbourhood<br>• External noise<br>• Air quality<br>• Heritage | • Climate and weather (site-specific sun, wind, temperature range, rainfall)<br>• Environmental risks<br>• Terrain and ground conditions<br>• Vegetation and ecology, significant trees<br>• Hydrology, wetlands and waterways<br>• Landmarks and items of significance to iwi and hapū<br>• Archaeology | • Education and cultural briefs<br>• Student narratives<br>• District or spatial development plan<br>• Community considerations |

#### 2.3.1 Cultural Activities

Ensure planning and design supports a range of cultural activities in an inclusive manner. Discuss how design can promote opportunities to engage in tikanga Māori and with tangata whenua and/or mana whenua.

Whare wānanga (or similar) and formal ātea spaces are not required in a school but may be desired.

Explore:

- how cultural activities can occur within existing spaces
- where spaces to support cultural activities could be created as part of a school's long-term plan.

For new projects, explore how key buildings can support both education and cultural activities. The Ministry's preference is for multipurpose buildings that have flexibility to be used in various ways.

## 2.4 Site Access and Circulation

Site access and circulation contribute to a functional, cohesive and connected school. Routes and entries must be sufficiently sized to accommodate the likely volumes of traffic expected at a school's Masterplan roll.

Ensure:

- entryways into a school are inclusive and support the integration of school users
- design enables all users to move independently and easily throughout a school
- vehicle versus pedestrian conflict is avoided – pedestrians movement takes priority over vehicle movement
- active (non-motorised) transport is promoted
- vehicle infrastructure is minimised, but functional, and safe for learners
- soft landscape around, and within, asphalt and concrete infrastructure is used to enhance the natural environment.
- climbability is to be avoided, particularly where there is risk of falling.

#### 2.4.1 Circulation Route Widths

Pedestrian routes should have a clear width determined by the expected level of use and must meet or exceed established minimum standards for primary, secondary, and service access routes.

**Clear Width**

Clear width excludes:

- opening doors and windows on primary circulation routes
- spaces where people are required to be stationary (for example, drinking fountains, lift entries, people seated on furniture or attending lockers)
- bag storage, fixed furniture or structures and handrails
- non-trafficable landscaping features.

**Circulation Obstacles**

Ensure obstacles to circulation are minimised through design.

Ensure unavoidable obstacles and fixtures:

- do not impact on circulation route widths
- are visually contrasted from surroundings to support wayfinding for low-vision users.

Features such as raking or angled posts must be avoided.

**Handrails**

Handrails are to be in accordance with legislative requirement.

Do not use handrails below the top of a balcony balustrade, unless required to meet NZBC.

## 2.5 Accessibility

Site access and circulation routes must be inclusive, support user safety and encourage independence/ minimise dependence on others.

Where specific Ministry standards are not outlined for accessibility:

- designers must pragmatically use universal design principles to guide design and planning
- NZS 4121 standards must be met or exceeded as a minimum.

A project must ensure that any future retrofit for incoming learners with high needs can be easily achieved without modifications to existing enclosures, circulation routes, structures or infrastructure services. In other words, it is acceptable to require add-ons for an incoming learner's specific, or unique, needs, but any current project should address the needs of most learners with accessibility needs.

**Inclusive Access to Education**

Planning and design must aim for equitable, inclusive access to education, recreation and common social areas.

Access to education does not always require access to every space in a school. The following examples show the intention of this principle.

i. A second soccer field on a different level will preferably have universal access, but access is not required if there are challenging constraints.

ii. A large secondary school with a small number of existing general teaching spaces upstairs may not require a retrofit lift to these spaces. Discuss whether the activities in these spaces can be carried out in more accessible locations to determine if lift access is required.

iii. A school's only biology lab is upstairs with no lift access. If biology cannot be relocated to an accessible area, a near-future project must include a retrofit lift installation.

iv. The only netball court is not accessible. A near-future project should provide universal access to this space.

Further supporting information on accessibility is available on our website.

**Staff Accessibility**

Staff must be able to access all student and staff areas. Full accessibility to maintenance and service areas is desirable where practical.

### Table 7: Minimum accessible circulation clear widths

| Route type | Minimum clear width |
|---|---|
| Primary circulation routes | 1800mm (internal and external) |
| Secondary circulation routes | External: 1800mm |
| | External low-volume foot traffic: 1200mm |
| | Internal: 1200mm |
| Service routes | 1200mm (internal and external) |
| Clear width between furniture or fixtures | A wheelchair user must be able to safely circulate to key spaces within an occupied room without undue disturbance of others. |
| Ancillary fire egress routes (including stairs) | Comply with NZS 4121 as a minimum |

### 2.5.1 Minimum Accessible Circulation Clear Widths

These widths are minimum clear widths for circulation routes, please refer to section 2.5.5 for guidance on appropriate clear widths for pedestrian routes based on foot traffic volumes.

### 2.5.2 Wayfinding

Design must support intuitive coherent wayfinding, with easy and clear identification of primary circulation routes through school sites and buildings. Reliance on signage must be minimised.

**Wayfinding for Accessibility**

Design to ensure easy wayfinding for vision-impaired learners. The introduction of a low vision learner into a school should not generate significant rework to new builds to improve wayfinding.

Light reflectance values (LRV) for key navigation components and building fixtures must have a LRV contrast of 30% or more, unless there are unavoidable constraints.

Consider luminance contrast, between components such as landscaping, posts, barriers and rails, circulation routes, walls, floors, level changes, doors, frames, hardware and sanitary fixtures.

Avoid patterns that confuse wayfinding. Wayfinding patterns or colour schemes on floors must not be confusable with level changes or steps.

**Full-height Glazing**

Provide banding or window manifestations that contrast with background surfaces, where there is a risk of wayfinding difficulties for low vision learners.

**Signage**

Signage must support universal design principles and be bilingual, where practical.

Consider the familiarity with a space that a user will likely gain through time. Spaces that are for learners or teachers only will likely need fewer signage interventions than spaces used by visitors.

### 2.5.3 Pedestrian Access

**School Entry**

Entry and circulation should reinforce a cohesive school layout with routes sufficiently sized to accommodate the volumes of traffic expected at a school's Masterplan roll.

Ensure:

- primary and secondary circulation routes are inclusive, equitable and fully accessible
- entryways for community, whānau and learners are together, not separated
- design enables all users to move independently and easily throughout a school.

**School Site Entry and Circulation: Pedestrian**

Consider site and neighbourhood context, pick-up and drop-off (PUDO) points around the school and natural desire lines.

Ensure:

- adequate entry and exit connections between a school and its immediate surrounds
- entry and exit points into and out of a school have quality oversight
- the main entry is adjacent to public reception
- student entry is celebrated and prioritised
- at least one primary entry supports cultural ceremony, ideally the main entry
- entry and approach widths are adequate for the peak loads at the start and end of school
- safe cycle and scooter entry routes.

### 2.5.4 External Site Circulation

External site circulation includes verandas, stairs, all-weather paths, tracks and hardstand.

Ensure circulation routes:

- are clear, logical and coherent for users
- provide inclusive, safe, equitable access for all users
- minimise travel distance and support user desire lines

For comfort and safety:

- minimise blind corners where pedestrians cannot see oncoming pedestrians
- ensure clear sightlines for vehicles and pedestrians where pedestrians can cross a vehicle route
- provide users with multiple options for site and building access
- design circulation routes using CPTED principles to maximise passive surveillance
-

design for weather protected primary circulation routes, where practical. Base the extent of circulation protection needed on local climate conditions and travel distances. Our preference is to have weather protected primary circulation through the provision of verandas.

**Covered walkways**

While standalone covered walkways are encouraged where necessary, for weather protection, full cover between buildings is not expected.

Ensure covered walkways support access for emergency, service and maintenance vehicles.

### 2.5.5 External Circulation Route Widths

External routes must be sized to accommodate two-way movement at peak times. Consider the size and type of school, likely volumes at peak times and whether the routes are to be shared with other modes of active transport.

## Table 8: Guidelines for pedestrian circulation routes for expected pedestrian group sizes

| Example footpath width (m)* | Likely pedestrian group sizes travelling: one way (two-way) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2(1:1) | 3(1:2) | 4(2:2) | 5(2:3) | 6(3:3) | 7(3:4) | 8(4:4) |
| |  |  |  |  |  |  |  |
| 1.2m | | | | | | | |
| 1.5m | | | | | | | |
| 1.8m | | | | | | | |
| 2.4m | | | | | | | |
| 3.0m | | | | | | | |
| 3.5m | | | | | | | |
| 4.0m | | | | | | | |
| 4.5m | | | | | | | |
| 5.0m | | | | | | | |

| | |
|---|---|
| | Too narrow, not permitted. |
| | To be avoided. Where unavoidable, provide frequent passing areas |
| | Preferred minimum width for primary school |
| | Preferred minimum width for secondary school |

**Note: the listed widths are in nominal increments for guidance. They are not intended to be taken as literal widths.*
*This table is not intended for guidance on the width of school main entry, high-volume routes in large schools or routes with shared modes of transport.*

### 2.5.6 Steps and Stairs

Table 9 outlines Ministry standards for steps and stair dimensions in schools. These dimensions do not apply to bespoke steps for landscaping, service stairs to non-occupied spaces or social learning terraces.

Table 9: Internal and external standard step and stair design standards

| Item | Standard |
|---|---|
| Stair widths | Stair widths are to follow the same standards as circulation routes.<br>Consider requirements for width per learner and two-way movement. |
| Tread depth (for primary and secondary routes) | Minimum 310mm, maximum 450mm. |
| Risers (primary and secondary routes) | Closed risers, height between 150mm and 180mm. |
| Stair nosing | Nosings must be provided, and be:<br>• round-edged<br>• slip-resistant<br>• a contrasting colour difference of 30% LRV or more to support wayfinding for low-vision users.<br>Nosing need not span the full width of a stair. |
| Centre handrails | Centre handrail spacing must align with requirements for width per learner and two-way movement. Consider contrasts for wayfinding. |
| Safety | Avoid blind corners. On primary and secondary routes, users must be able to see oncoming pedestrians. |

### 2.5.7 Landings and Wait Spaces

Provide clear landing spaces for lifts, stairs, entries and ramps as necessary to support independent ease of circulation for disabled.

A wait space for a lift must not adversely impact a primary circulation route or a person waiting for a lift. Designers must consider traffic volumes, desire lines and clear width requirements.

### 2.5.8 Ramps

Design to maximise access routes of 1:20 gradient or less to avoid or minimise the need for ramp access.

Ramp locations must be inclusive and adjacent to primary circulation routes. Explore key primary circulation routes to and from facilities to ensure that access is equitable, where possible.

Avoid separate access routes to facilities. Explore using ramps as the inclusive primary access route for all users.

#### Ramp Design and Length

A ramp's design and length must take into consideration travel times and the strength required to travel the entire ramp. Ensure access design considers usability, a ramp may not be a practical solution for access on some sites.

## Table 10: Ramp requirements

| School type | Requirement |
|---|---|
| Ramp length | Avoid ramp lengths greater than 30m. |
| Gradient | Ramps must be no greater than 1:14 gradient. Aim to maintain an even gradient between connected ramps. |
| Ramp width | For ramps incorporated into a primary or secondary route, match the minimum width of the circulation route. Ramps must not create circulation bottlenecks on primary circulation routes. |
| Entry to buildings | Apply universal design principles to building entry. |
| Ramp landings | Provide clear landing space of 1800mm from the ramp slope. |

### 2.5.9 Access to Outdoor Recreation Spaces

The preference is for NZS 4121 accessible routes to outdoor recreation and learning spaces. In some schools the topography or distances may make this prohibitive. Long ramps to sports fields may not be functional or practical. In these instances, a track is an acceptable option.

Where a track is agreed as an acceptable solution, use the following as guidance:

- use switchbacks to achieve a suitable gradient
- ensure the switchback gradient and radius is safely manageable for a wheelchair user
- consider regular gentle reverse gradient landing areas to assist with resting and erosion management
- provide a compacted gravel-mix surface
- provide handrails only where required for user safety reasons.

### 2.5.10 Handrails on Travel Routes

Handrail design and application must be safe, inclusive and appropriate. Handrails must not project into circulation routes.

Handrails are not to be used along the inside face of balcony balustrades unless required to meet NZBC regulation for egress ways ie stairs.

## Table 11: Dimensional standards for handrails

| School type | Standards |
|---|---|
| Schools with primary-school-aged learners | • 32mm diameter handrail<br>• 840mm rail height<br>Provide a second rail at 650mm if:<br>• a rail will support ease of mobility, and<br>• the fall height from the walking surface is less than 1m. |
| Schools with only secondary-school-aged learners (year 9+) | Meet NZS 4121 standards as a minimum. |

### 2.5.11 Balustrades

All barriers must be fully compliant with the New Zealand Building Code.

The Ministry prefers structural post connections to have a robust connection between the structural post and structure. This generally requires an out-of-plane leaver arm between structural bolts ie a 'L shaped' base plate with once face on the top of the floor and one on the face, a top mounted four bolt base plate or a face mounted fixing plate (or similar).

The Ministry requires the building design engineer to take design responsibility for the structural post connections to the structure to the specified loads.

Table 12

| School Building Use | Description | Table 3.3 NZS1170.1 Classification |
|---|---|---|
| General/teaching areas | **Ground floor** | C3 |
| | **Above ground level** | |
| | < 250 students per level | C3 |
| | > 250 students per level | C1/C2 |
| Equipment/service areas where students are prohibited | | E |
| Assembly areas | **Specialist auditoria:**<br>Confirm with delivery manager, generally in accordance with Guidance on Barrier Design, March 2012. | |

### 2.5.12 Safety from Trips and Falling

**Walking Surfaces**

Avoid curbs in or near spaces accessed by learners. Changes in level must be easily identifiable.
Our preference is for flush transitions between surfaces that will be regularly accessed by learners throughout a school day.

**Barriers**

Designers must apply Safety in Design to determine barrier height and design.

When specifying barrier materials, consider:

- noise blocking needs
- daylighting
- visual connectivity and oversight requirements.

## 2.6 Transport

The traffic design near schools is to prioritise pedestrians and learners and to comply with best practices. Ensure early engagement with local roading authorities to enable safe and functional outcomes for learners and the school site.

Design teams must apply best practice for transport design within school grounds, as would be expected for design in public spaces, with best practice for pedestrian safety the key priority. It is expected that designs support a coherent school traffic management plan.

### 2.6.1 Site Vehicle Entry

When planning, consider:

- existing pedestrian routes and wider traffic contexts
- whether site traffic is low or high volume (in the context of vehicle traffic on school property)
- requirements for car parking, pick-up and drop-off (PUDO), service access and emergency, mobile health and education vehicles.

Ensure vehicle access prioritises:

- safe pedestrian routes and school entry when designing traffic movement
- pedestrian safety, that is, separation of vehicles from pedestrians
- minimal vehicle roadways within schools to support maximum space for learners
- utilisation of space not suitable for learners before encroaching on space that could be used by learners.

### 2.6.2 High-volume Site Traffic

Ensure high-volume traffic areas are dedicated as vehicle-only access routes and that these routes:

- minimise impact to pedestrian entry or circulation routes
- are placed in marginal areas of a school, where practical.

### 2.6.3 Low-volume Site Traffic

Avoid creating vehicle-only access routes when traffic volume is expected to be low.

Where practical, the preference is for low-volume vehicle access routes through schools to be designed as shared paving or hardstand for learners' use during school hours. These routes must support occasional, out-of-hours or maintenance vehicle access.

### 2.6.4 Deliveries

Consider:

- the safety, frequency and volume of deliveries expected for each facility
- how delivery vehicles will be managed as they move through the school
- how drivers will sign-in.

Table 12: Delivery access requirements

| Delivery type | Requirement |
|---|---|
| Admin delivery | Delivery access must be adjacent to admin. |
| Occasional, high-volume or heavy deliveries | Provide suitable hardstand access adjacent to facilities. Defined road access may be useful but is not required. Vehicle-only routes that have occasional use must not be designed into areas that could otherwise be used for student activities. |
| Frequent daily deliveries | Direct vehicle access is preferred, providing vehicle routes are not occupying space that is necessary for learners. |
| Frequent, low-volume deliveries | Delivery via trolleys is acceptable. Direct access is not required. |

### 2.6.5 Pick-up and Drop-off (PUDO)

**General**

PUDO routes must:

- not conflict with bus or pedestrian routes
- not allow vehicles to reverse into primary vehicle or pedestrian routes
- avoid crossing the main pedestrian entry of a school
- be designed to prevent stationary vehicles from restricting traffic flow
- It is acceptable to have PUDO placed away from the main entry.

The strong preference is for:

- PUDO to occur off-site, located to avoid learners crossing vehicle routes
- several PUDO options near a school reduce congestion, and improve pedestrian safety
- drop-off zones to be parallel to a vehicle way and marked to prioritise PUDO activities.

**Learning Support PUDO**

All schools must have at least one PUDO zone suitable for mobility-impaired learners, adjacent to an accessible route.

The preference for learning support PUDO is for parallel accessible carparking with sufficient space for side and rear exit from a vehicle.

**Specialist and Satellite School PUDO**

PUDO for specialist learning support facilities are to be inclusive and integrated with the general PUDO areas as much as practical, while also supporting a specialist school's needs to safely manage learners.

The preference is for a shared site entry where practical.

When required:

- provide an appropriate amount of weather protection to the PUDO area, and
- minimise travel distance from PUDO to learning spaces — the preference is for direct access but this must not come at the expense of integration of a facility within a school.

**Bus PUDO**

Bus PUDO design must:

- meet best practice for traffic design around schools
- promote the safe transport of learners by bus
- not impact on vehicle PUDO, school pedestrians or space for learners
- be functional for the level of school transport provision required.

It is acceptable for the bus PUDO to be away from the main entry of a school if this reduces conflict and improves safety outcomes.

Bus PUDO standards are:

- bus parking must not occupy space on constrained school grounds where the space has potential to be used by learners or to meet infrastructure requirements
- buses must have a dedicated space at PUDO times, which does not compete with other traffic
- bus PUDO locations should be located to minimise the need for learners to cross vehicle routes
- traffic and pedestrian management devices must be used where necessary for safety.

### 2.6.6 Carparking

Table 13: Carparking requirements

| Area | Requirement |
|---|---|
| Safety | Design parking for safety and good traffic flow. Parallel parks are preferred. Reversing into PUDO, bus or traffic lanes must be avoided. |
| Accessible parking | Provide near reception, and other key spaces. Exceed Building Code requirements where necessary to achieve equitable access.<br>Ensure these carparks can support PUDO for mobility-impaired learners. |
| Constrained or large school sites | Ensure that the minimisation of car parking is explored through a Traffic Management Plan for large or constrained sites. |

### 2.6.7 Cycle Access and Parking

Cycle access routes must be designed to be safe and minimise conflict with pedestrians. Connect school access into existing public cycleways, where available.

Cycle parking must:

- have passive oversight and securely fixed racks
- be an efficient use of space and sufficiently sized to support demand.

### 2.6.8 Emergency and Maintenance Access

Ensure access supports:

- Fire and Emergency NZ requirements
- maintenance equipment and vehicle access to the site and building perimeters
- future construction access.

### 2.6.9 Mobile Education Vehicles

A dedicated space is not required for these vehicles. It is acceptable to identify car parking spaces that can be used for occasional visits by external providers.

When locating these vehicles, ensure:

- the parking location is flat and reasonably connected to learning
- potential vehicle dimensions and turning circles are accommodated
- services are provided as needed.

## 2.7 Landscape Planning

Schools are communities, so design teams must consider urban design principles when developing landscape plans. Landscape planning must contribute to a coherent functional school site and provide a hierarchy of quality outdoor spaces appropriate for a school and its various groups of learners.

Landscape planning must align with our site planning priorities and support a school's long-term property development plan.

When planning, consider:

- the size of a school, and its outdoor space needs
- the specific needs of different age levels (learning and recreation needs)
- opportunities to support a school's cultural narrative
- the natural environment, local ecology and soft landscape
- preserving significant trees and prioritising native planting over exotics
- maximising access to bush areas for learning and recreation, where practical
- how circulation features such as stairs, decks and ramps can cost-effectively support social gathering or learning activities.

When designing:

- maximise and activate usable space by providing:
  - shade and shelter from prevailing winds,
  - features that are functional and attractive to users,
  - spaces that prioritise learners and pedestrians, and
  - spaces that can be occupied without disruption from circulating people
- provide a high-quality natural outdoor environment, whilst also maximising usable space
- support Safety in Design, and site security outcomes through landscaping
- ensure building exteriors can be made accessible for maintenance
- ensure landscape design supports our priorities around a low maintenance burden
- avoid planting that may impact the performance of a building's envelope — trees known to be problematic to paving, rainwater or stormwater systems must not be planted near school buildings.

### 2.7.1 Maintenance Access

Landscape design must support easy maintenance access to buildings.

Consider:

- planting and tree locations near buildings
- structures and fixtures — any fixed items should be reasonably easy to remove and reinstate as required for maintenance access. Fixing to buildings must be avoided.

### 2.7.2 Outdoor Learning

Outdoor learning spaces are external spaces where ākonga can extend learning activities, whether for investigative or making activities, physical activity or for quiet withdrawal. Usable space for outdoor learning is to be maximised.

Consider:

- access to fixtures and fittings needed to support learning, and
- how spaces can also be used for social recreation.

Outdoor learning spaces must be:

- physically and visually connected to indoor learning spaces to allow seamless, convenient use and quality oversight
- climatically pleasant and, where possible, all-weather
- well-proportioned, functional for the expected learning needs and separate from primary circulation routes to enable undisturbed learning. Avoid narrow outdoor learning areas that impact functionality.

### 2.7.3 Passive Recreation

Passive recreation spaces are where school users learn, socialise, play informally and eat.

Passive recreation spaces must be:

- adjacent to learning spaces
- provided in a range of areas and sizes to allow for an ability to create zones, a sense of place, and a degree of intimacy. A single large area in a large school is to be avoided.

Consider:

- scale and climate —excessive shading and overexposure to wind must be avoided
- providing purposeful landscaping design and fixtures that provide amenity for ākonga.

### 2.7.4 Active Recreation

Active recreation spaces are where learners can undertake sporting and physical recreation activities. They can include areas for playgrounds and fitness or physical education activities.

Active recreation spaces must be:

- adjacent to halls, gymnasiums, and/or changing facilities for physical learning activities where required
- set back from neighbours, property, and hazards where practical
- have good oversight for safe unsupervised use, during, and out of, school hours
- easily accessible

- appropriately sized for the activities undertaken and the age of participants.

Locate sports courts and fields to allow:

- physical education to occur without noise disruption to nearby indoor learning
- adequately connected to learning facilities for other activities and sports
- informal recreation and play

Orient courts and fields to be:

- adjacent to each other along their length to support flexibility in use for other activities and sports
- north-south along the length to avoid low sun glare, where possible.

### 2.7.5 Sports Field and Court Quantities

Planning must aim to support the recommended court and field quantities outlined in table 14. However, achieving the recommendations below must not lead to poor outcomes for building placement or for outdoor learning and passive recreation spaces.

The maximum number of courts or fields should be optimised to support school educational requirements.

Highly constrained sites may require bespoke solutions for access to active recreation space.

Table 14: Recommended sports field and court quantities

| School site size | Sports area | Recommended quantities |
|---|---|---|
| Unconstrained school | Sports field | 1-2 fields per sports code. Ensure placement supports summer sports requirements. |
| Constrained school | Sports field | Two marked fields are preferred, ensure at least one full-size field (see table 15 below). Consider summer sports with field placement. |
| Highly constrained school | Sports field | One full-sized field where possible, providing this does not create poor outcomes for property or other priorities such as passive recreation space. |
| All sites except highly constrained. | Hardcourts | 1 court per 200 learners, up to a 400 roll.<br>After this, 1 court per 300-500 learners depending on the recreation requirements of a school. |

**Quality outdoor space is a necessary part of a quality learning environment; an important resource for learning, green space, wellbeing and recreation**

### 2.7.6 Sports Field and Court Dimensions

All courts and field dimensions must:

- provide flexibility to be used for a range of active recreation activities
- have at least one long edge where groups can gather without impeding sports activity.

Table 15: Recommended marked sports field and court dimensions:

| Learner year group | Court type | Recommended marked area | Recommended overall area *incl. run-off for single courts/fields*** |
|---|---|---|---|
| Years 1-6 | Sports field | 60m x 40m | 80m x 50m |
| | Hard court | 30.5 x 15.25m* | 36m x 21m |
| Years 7-8 | Sports field | 70m x 50m | 90m x 60m |
| | Hardcourt | 30.5 x 15.25m* | 36m x 21m |
| Years 9+ | Sport field | 110m x 68m | 130m x 80m |
| | Hardcourt | 30.5 x 15.25m* | 36m x 21m |

**Netball court dimension. Other hardcourt dimensions are generally smaller, aside from futsal.*

***run-off area should be reduced between fields or courts adjacent to each other, subject to ensuring there is adequate space for spectating and teams.*

Where a field or court has a hard boundary, such as a building or fence, ensure primary circulation space is provided where required. Circulation and sports activity must be able to occur at the same time.

## 2.8 Building Area: School Property Guide (SPG)

Designers must work to area briefs for projects and long-term plans.

Adherence of SPG establishes equity of spatial allocation across schools.

Before developing a design, designers must have a clear understanding of Ministry SPG area policies and definitions. The following headings and tables provide information to support designers understanding SPG rules.

### 2.8.1 SPG Area Definitions

Table 16: SPG area definitions

| Category | Definitions | Comments |
|---|---|---|
| Total building envelope ($m^2$) | Total building envelope refers to the total SPG area ($m^2$) entitlement for a school. The total building envelope is generally the maximum property area ($m^2$) that a school can be provided. | This definition applies specifically to net floor area but is also to be considered for gross floor area, unless this leads to poor outcomes. |
| Net floor area | Net area is occupiable usable area for teaching and non-teaching functions within buildings. | Net area excludes necessary circulation space within buildings, corridors, foyers, lobbies, cleaners' cupboards, service rooms, change spaces and toilets, walls and structure, and spaces that are not designed to be occupied by people. |

| Category | Definitions | Comments |
|---|---|---|
| Gross floor area | The area enclosed by all the exterior walls of a building, measured to the external face of the external walls. | Gross floor area includes everything within the building footprint, such as teaching spaces, mezzanines, internal partitions, corridors, toilets, lifts, stairwells and cleaners' cupboards.<br>Lifts, stairs and voids must only be counted on one floor. |
| Teaching area<br>(net teaching and net library space) | Net floor area that can be used for teaching and learning activities, including library areas.<br>Otherwise known separately as net teaching space, or net library space. | Note: hall and gym areas are for teaching and learning but are defined as separate SPG areas. |
| Non-teaching area<br>(net admin and net resource space) | Net areas used to support school administration needs, canteen/ cafeterias, and resource storage necessary to support administration, teaching and learning.<br>Otherwise known separately as net admin and net resource space. | Generally, admin space is where staff reside and resource space is where equipment resides, however there is flexibility with how these areas are defined. |
| Multipurpose hall | Net area used for school hall functions of school gatherings, physical activities, cultural ceremony, assembly performance and so on. | Buildings used for whare or cultural purposes can be classified as multipurpose if they are used intermittently by teachers and students. If a whare wananga or similar is occupied regularly by a Kaiako or teacher, it is best defined as a teaching space. |
| Gym | Gym area is net gym space or teaching spaces connected to a gym that are primarily used for practical physical education purposes. | Spaces that can be used for general theory-based learning should be classified as teaching space, not gym. |
| Legitimate | Spaces and facilities 'hosted' on a school site. | Often used by organisations or agencies external to a school, and not used to deliver a school's curriculum. |
| Other (ancillary) | Other is for:<br>• standalone buildings housing infrastructure, plant, or equipment used to service or maintain a school (ancillary buildings not intended for occupation)<br>• buildings not owned by the Ministry. | Area within a building used for teaching or non-teaching purposes cannot be defined as other. |

### 2.8.2 Long-term Plan SPG Requirements

Long-term plans must show a site plan with the school's property provision (in square metres) eventually equaling a school's Masterplan SPG entitlement.

Exceptions to this are when there is unresolvable legacy surplus or deficit that is not likely to be resolved or replaced in the next 50 years. Discuss these instances with the Ministry for direction on how to proceed.

### 2.8.3 Project Area SPG Requirements

Projects must provide the area required for buildings to be fit-for-purpose and functional, no more no less. That is, provide appropriately sized teaching and non-teaching spaces rather than work to the SPG entitlement tables which may have deficit or surplus issues.

The total gross area of a new project must be built within the following parameters:

- all gross floor area allocation must be provided within the building footprint
- net teaching space must be delivered as functional areas that can be easily occupied for teaching and learning without disruption from circulation movements
- maximise the gross area that is connected to net teaching area for additional indoor learning opportunities, while ensuring circulation, toilet and storage provision is functional
- non-teaching SPG net area allocations can be redistributed, within reason and within total building envelope policy rules, for other learning-centred purposes following discussion and agreement with the Ministry. This is provided it can be demonstrated that a school could reasonably operate and deliver the curriculum, taking into consideration Ministry priorities of adaptable buildings and protecting assets for future generations.

For school buildings three storeys or greater with internal primary circulation, gross floor area provision may need to be greater than the standard net-to-gross multiplier of 1.3 to:

- preserve net teaching area, and
- allow for additional internal circulation requirements.

Any additional circulation area required to preserve net area must be:

- agreed by the Ministry beforehand, and
- designed efficiently, to optimise additional area required.

### 2.8.4 Net Area Per Learner Recommendations

The sizing of spaces must take into consideration the types of activities carried out and the number of learners.

Table 17: Area per learner recommendations for various learning spaces

| Space type | Recommended net area per learner |
|---|---|
| General learning areas | Primary school: 3-3.5m$^2$ depending on expected practices<br>Secondary school: 2.5-3m$^2$ depending on expected practices<br>Breakout spaces used for short periods of time: 1-2.5m$^2$/learner, subject to dimensions, age of learners, and expected use of space. |
| Secondary school practical spaces | 3.5-6m$^2$ per learner, subject to activity, expected use of space and specialist furniture and equipment requirements. |

## 2.9 Building Placement, Form and Envelope

The placement and configuration of buildings on a school site are important aspects of creating quality schools. Building placement and configuration must consider a school's long-term plan and comply with our design standards.

Deviations from any existing Masterplan or long-term plan require revalidation and approval. Where there is not a long-term plan in place, ensure our wider principles and priorities outlined in this document are met and a long-term plan is developed.

### 2.9.1 Building Placement considerations

Table 18: Considerations to be made when placing buildings

| Consideration | Requirement |
|---|---|
| Adequate building size | Use accurately scaled gross area ($m^2$) for a building. Ensure roof overhangs, upper-level decks and stairways are included and shown. |
| Educational requirements | Ensure functional needs and key adjacencies are known. |
| Existing site features and constraints | Ensure site features, constraints and opportunities are understood prior to building placement. |
| Minimise impact on other buildings, trees, and spaces | Preserve the amenity of key existing or future planned buildings, spaces and infrastructure.<br>This includes outlook, connectivity, wind and shadow impacts on outdoor spaces. |
| Passive building performance | Orient buildings to promote high-quality passive performance. |
| Coherent placement and placemaking | An existing school has an established 'grain' and hierarchy, with relationships between buildings, circulation and outdoor spaces. Where sensible, go with the 'grain' of the school.<br>Always place buildings with careful consideration of how each edge relates to any buildings and spaces immediately adjacent.<br>Ensure building placement supports high quality placemaking outcomes for learners and a school. |
| Preserve the site | Place buildings to support the potential for development beyond a Masterplan roll. Design must create compact efficient sites. Inefficient occupation of space on a site, or over-sized outdoor spaces between buildings must be avoided. |
| Connect to the outdoors | Place buildings to support the creation of quality circulation and outdoor spaces. Our preference is for multiple building sides to be connected to quality outdoor spaces, where possible. Avoid creating marginal unusable spaces with building placement. |
| Minimise impact on neighbours | Minimise any temporal and environmental impact on neighbours with building placements. |

### 2.9.2 Building Form

Building form must be sensitive to the site context and the educational needs of a building. Simple and purposeful forms are expected for reasons of function, cost, adaptability and durability. Buildings must not be of an irregular or complex form unless there is strong functional merit, or there are unavoidable constraints.

Consider how the built form can contribute to:

- the activation of outdoor spaces for learning and recreation
- the definition of outdoor spaces
- connectivity and circulation
- supporting functional internal layouts. A degree of concept planning must be undertaken to ensure this when planning large buildings.

### 2.9.3 Narrow vs Deep-plan Buildings

Generally, narrower buildings can offer easier control of the indoor environment and are well connected to the outdoors. However, they can offer less flexibility for some teaching and learning practices. They can also be less adaptable. For flexibility and adaptability reasons, new learning blocks less than 12m deep should be avoided.

Deeper plan buildings can, at times, offer spatial benefits. When designing deep-plan buildings, ensure:

- adequate daylighting can be achieved
- the building depth is sufficient if the building is to have 'double-stacked' learning spaces
- width requirements for teaching spaces and circulation are considered.

Carefully consider building depth based on educational needs, school context, and our asset priorities.

### 2.9.4 Multi-level Buildings

Multi-level buildings are the preferred solution for constrained sites. When considering the building's location and form, you must consider:

- how to achieve efficient, high-quality circulation through the building
- the placement and impact of vertical circulation, plant and building services
- how noisy and/or messy learning activities can occur on each level
- strategies for achieving quality indoor environments.

### 2.9.5 Building Envelope

To enhance a building's ability to be repurposed or reconfigured over its lifetime, ensure:

- there are adequate entry points to the perimeter of a building to reduce dependence on internal circulation routes
- all spaces are adequately glazed, regardless of whether an internal space intends to be occupied by users or not
- the amount of building perimeter that is of a high quality for learning or recreation is maximised. Unobserved service areas are to be minimised.

For connectivity, outlook and flexibility, ensure that there is high-quality visual and physical connection to the natural environment and covered outdoor learning. Ensure window dimensions and sill heights consider:

- non-ambulant learners, young learners and whether learning will occur on floors,
- where desks or benches may be placed against walls (or windows), and
- indoor environmental needs.

## 2.10 Building Interior Planning Priorities

Designers must be familiar with appropriate design responses to various teaching and learning practices. Design must clearly respond adequately to a school's educational needs, while also responding to Ministry priorities for learners and property.

This section outlines our internal planning priorities for school buildings. These priorities apply to all occupiable school buildings.

### 2.10.1 Adaptable Buildings

Design to allow reconfiguration and usage change over a building's lifetime without significant changes to the envelope, structure or internal services.

The following features are generally more adaptable:

- non-structural internal walls that terminate at the underside of the ceiling
- sufficient accessible entry points to the building

- vertical circulation and services:
  - › located near primary circulation routes
  - › to the edges of buildings and reasonably distributed.

Avoid grouping service areas if this would prevent connectivity, expansion, or reasonable reconfiguration.

### 2.10.2 Maximise Usable Area

Within the gross floor area (GFA) of a building, look to maximise usable space and minimise service and circulation-only space.

The following points are to be considered and prioritised when planning:

- reduce circulation route lengths through efficient placement of main entry points
- avoid creating circulation desire lines that could disrupt areas of group learning — consider the relationships and connections between spaces, amenities and circulation access points
- eliminate narrow learning spaces (which effectively become wide corridors) on circulation desire lines — any narrow learning space must provide undisturbed occupation, away from primary circulation routes
- minimise space given to atria, lobbies, entryways and corridors — avoid creating unintentional circulation-only space within buildings
- minimise the number of small rooms and offices — small rooms are an inefficient use of space due to a high circulation area to usable space ratio
- design efficient utilisation of resource storage space — look to integrate resource storage within other spaces and avoid standalone storage rooms
- for practical learning subjects, make resource areas usable for learning activities.

### 2.10.3 Flexible Buildings

Provide purposeful spaces to support an appropriate range of learning approaches and activities.

Key requirements are:

- maximise flexibility for multiple uses to support a range of learning approaches and curriculum subjects
- minimise single-use spaces, especially spaces that are not likely to be highly utilised
- design to provide learners with choices that support various learning modes or learning preferences
- support integrated learning practices by providing physical adjacency and connection between key teaching spaces, including connection between general and practical or specialist learning spaces
- minimise barriers to cross-curricular learning. and collaborative teaching.

### 2.10.4 Inclusive Planning

All new buildings must provide quiet student spaces that support the needs of neurodiverse learners.

Planning must identify spaces that can provide quiet and calm for learners. These spaces should be available throughout a school and be connected to learning.

### 2.10.5 Functional Buildings

Design functional buildings by providing adequate space and amenity.

Taking into consideration building and user needs, provide:

- practical subject spaces with a quality physical connection to outdoor learning and adjacent learning areas
- a degree of physical separation between quiet and noisy spaces — plan for adequate noise zoning to minimise the extent of acoustic treatment
- adequate circulation, support spaces, and utilities to provide the level of amenity required for a building. If a building is multipurpose, consider the needs for each of the various uses.

## 2.11 Building Circulation

### 2.11.1 Circulation Efficiency

Ensure circulation routes support desire lines and are efficient in the use of space.

Explore opportunities to connect buildings at the upper levels to reduce circulation times, especially for wheelchair users.

### 2.11.2 Vertical Circulation (Internal and External)

New builds should aim to have at least one stairway sheltered for wet weather circulation.

For warm and moderate climates, our preference is to have primary circulation stairways external to buildings.

Large multistorey buildings, or buildings in cold climates, may require an internal primary circulation stairway for the best outcomes.

Stair locations must:

- be placed coherently to support site and building circulation routes
- not negatively impact building adaptability, daylighting, connectivity, or outdoor spaces.

### 2.11.3 Accessibility

Ensure all horizontal circulation routes are continuously accessible to all learning and teaching spaces, including outdoor learning areas.

### 2.11.4 Doorways

Minimise doors throughout buildings.

Provide clear space for wheelchair manoeuvring must be provided on both sides of a door.

Table 19: Minimum standards for access into spaces and buildings

| Item | Standard | |
|---|---|---|
| | Minimum clear opening | Recommended minimum door width |
| Primary and secondary access route door* | 850mm | 910mm |
| Accessible toilet door | 850mm | 900mm sliding door (preferred)<br>910mm hinged door |
| Standard toilet door | 710mm | 760mm |
| Ancillary fire egress door | To fire standards or 810mm, whichever is greater, if not for wheelchairs | 860mm |
| | 850mm if necessary for wheelchair egress | 910mm |
| Service area door leaf width | If a service space is for maintenance access only, then NZS 4121 accessibility is acceptable, otherwise meet door width standards for primary and secondary access routes. | |
| Unobstructed space from the latch side of door to nearest wall or obstacle (measured from the door frame) | 300mm to push and pull side. | pull side - 600mm<br>push side - 450mm. |

| | |
|---|---|
| Level threshold | The preference is near as practical to a level threshold. Avoid undulated obstructions across a threshold, or gaps that may trap the small wheels of walking frames.<br>Ensure design:<br>• also meets Ministry priorities for weathertightness and joinery durability, and<br>• provides adequate clearance, allowing for long-term settlement, between the ground and the bottom of a hinged door. |
| Usability | Hinged and sliding doors must be easy to open by all users. |
| Clear opening width | Design must provide minimum clear opening and consider opening angle. |

**Where a space has adjacent sliding and hinged doors, only one entry needs to be fully accessible. That is, if a sliding door provides equitable access and is fully accessible, then the adjacent hinged door can be of a standard opening size.*

### 2.11.5 Lifts

When planning lift locations and quantities, optimise lift locations to minimise travel distanced and the number of lifts needed in a school. Consider:

- site circulation routes and desire lines between buildings
- the likely number of lift users and their mobility needs
- worst case circulation distances from a wheelchair user's perspective, whilst avoiding excessive lifts in a school.

Ensure lifts are located:

- for efficient circulation routes
- to provide reasonable equity in travel routes
- where adequate waiting space can be provided on high-volume primary circulation routes
- adjacent to primary circulation routes. Externally placed lifts are an exception and must meet our additional durability requirements.

New lifts must meet the following standards over and above NZS 4121:

- All lifts must have quality passive oversight for easy management of lift use, to avoid the need for keys.
- Lifts must not require a physical key to unlock lift access for learners during everyday use.
- Avoid separate lift lobbies unless required for fire safety.
- Lift landings must have functional waiting space that does not excessively impede circulation. Where a lift opens into a high-traffic route, additional waiting space area must be provided.
- Ensure lift controls meet universal design principles, including audio and visual cues to alert users.
- For buildings with more than one lift, at least one lift must provide access to learning with an internal lift-car dimension of 1800mm x 1500 mm*. Additional lifts within a building can be provided to NZS 4121 dimensions, providing this would not be prohibitive to a learner moving reasonably throughout a school.

*Lifts to staff only spaces are not required to be 1800mm x 1500mm, providing the lift has no potential for use by learners.

### 2.11.6 Platform Lifts

Platform lifts are acceptable for access to facilities such as a stage or raised platform, or non-teaching spaces, where a ramp or lift is not practical.

Platform lifts must:

- be rated to accommodate 300kg minimum
- be of a commercial quality
- have ongoing maintenance and parts support readily available

Platform lifts travelling more than 2m must:

› be enclosed

› have Safety in Design features equivalent to a commercial lift car.

### 2.11.7 External Lifts

External lifts are not preferred for durability and functional reasons. If proposed, an entry lobby should be included in the design.

If a lobby is not practical, the following criteria must be met:

- The lift face and waiting area is fully sheltered from prevailing wind and rain so that no rain can reach the doors or enter the lift shaft.
- Separate waiting space must be provided if lifts are on primary circulation routes.
- Surface water is physically prevented from entering the lift shaft.
- An entry mat is installed outside the lift to prevent trafficable debris and moisture entering the lift car.

Design and specify the internal lift shaft and car materials for appropriate resilience against the external environment.

Lifts in corrosion zones must have an enclosed entry lobby.

### 2.11.8 Service Lifts

Ensure lifts that may double as service lifts are appropriately sized and specified.

## 2.12 Learning Spaces

This section outlines the requirements for specific learning spaces in the school environment.

### 2.12.1 Learning Spaces

For traditional-style, celluar teaching spaces, consider:

- the requirements in section 2.13.1 (especially withdrawal space for learners), and
- providing an ability for co-teaching or cross-curricular learning to occur between some, but not all, adjacent spaces. This includes subject areas that are: general to general, specialist to specialist and general to specialist. Make sure that any connection does not impact on the quality of a space for teaching and learning.

### 2.12.2 Flexible Learning Spaces

For flexible learning spaces, look to provide:

- adequate amenity for teacher presentation to groups — spaces that support different teacher locations within the room are preferred
- spaces for large-sized learner groups to carry out activities that do not disturb neighbours
- withdrawal spaces for learners
- flexibility for variation in group sizes — consider how expansion can occur into adjacent areas, or how larger spaces could be partitioned with furniture or screens
- learning edges, corners, cul-de-sacs and nooks — consider where teachers can present to class-sized groups and where individuals or smaller groups can retreat to
- space to celebrate the work of ākonga.

Ensure:

- withdrawal spaces are available for learners to withdraw to. It is not expected that every teaching space has a formal breakout space if this would impact on (the usability of) the general learning space. Look to create breakout space that is accessible, visable and shared between a number of teaching spaces
- adequate visual connectivity to adjacent spaces.

### 2.12.3 Breakout or Withdrawal Spaces

When planning breakout spaces, ensure:

- withdrawal spaces are visually and physically connected to learning spaces (This takes precedence over acoustic separation.)
- each learning groups have functional access to at least one smaller sized breakout space (For usability, these spaces should ideally accommodate around four to six learners, but this number is flexible.)
- each learning group has access to an acoustically private space
- larger collaborative learning areas have at least one space for occasional noisier group activities, or withdrawal (Depending on the group size and frequency of use, these spaces may be around 35-45m$^2$ for a full sized class group. This size is not considered adequate for ongoing occupation by a large class group.)
- the number of hinged door into a breakout is

minimised to allow better use of wall space — avoid excessive entry points
- when using doors, choose an appropriate types to support functionality simplicity and connectivity.

### 2.12.4 Maker Spaces

Maker spaces are simple project spaces adjacent to general learning areas. They are used for practical, creative and investigative projects. These spaces should be capable of accommodating a range of group sizes without compromising available space for learning. For smaller learning areas, ensure large groups can use adjacent spaces for occasional maker activities.

When including maker spaces, ensure:

- high-quality physical and visual connection to adjacent learning areas, and outdoor spaces, to support larger groups or flexible use
- that services are on the perimeter where possible, minimising fixed services to the centre of a building
- storage space for equipment and resources is provided.

Explore any services required for outdoor maker spaces. If required, our preference is for water services to be away from the building envelope.

### 2.12.5 Specialist Spaces

Generally, specialist curriculum subjects are for learners from year 7 upwards. Some specialist subjects can be carried out in general learning spaces at desks. The more practical subjects require a larger area per learner to allow for moving around, equipment and space for resource storage.

For specialist learning areas, consider:

- the number of ākonga expected to occupy the various spaces and the area per learner required
- whether teacher presentation to groups is required (digital, mobile or fixed) — avoid creating teacher-only presentation areas within specialist learning areas as these may detract from the net area available to ākonga
- location within a school for curriculum adjacencies, service access and outdoor learning
- the indoor environmental controls needed, for example, lighting, noise, sound, dust, and ventilation
- staff workspace and resource space needs — look to combine teacher and resource spaces across curriculum subjects where possible
- Safety in Design

Provide an adequate level of space for:

- equipment, machinery, materials and project storage
- learners, teachers and staff
- safety equipment and safe storage of learner belongings.

Ensure spaces support flexibility in teaching practices by:

- creating multipurpose spaces— consider grouping spaces into categories, such as wet vs dry, quiet vs noisy, or dirty/dusty vs clean
- placing some spaces for general learning, or theory, adjacent to practical or specialist spaces
- co-locating compatible specialist subjects to support opportunities for integrated, project-based learning
- not placing resource and admin spaces in locations that prevent the (current or future) potential for connectivity.

### 2.12.6 Library Spaces

Modern libraries are multipurpose spaces. Library planning should follow the principles of flexible general learning spaces. Consider how libraries can be used to add amenity to other spaces through co-location.

Consider:

- what adjacencies and functions are desired from a library space
- whether library space could be used to support student recreation or community activities
- connection to pleasant outdoor spaces.

Ensure library space is:

- co-located with acoustically compatible spaces
- strongly connected to learning and outdoor spaces, and supports our connected schools and adaptability principles - avoid standalone library buildings
- central, to provide the ability for library space to support various school needs.

For constrained sites, explore how library spaces can best support passive recreation during breaks.

### 2.12.7 Multipurpose Halls

Multipurpose halls are used for a range of activities including performance, assemblies, ceremonies, cultural events, physical activity, and community use.

Consider:

- what adjacencies and functions are a priority for a hall space
- whether sleepovers and cultural activities are desired or likely to occur at some point in the hall's life
- how the space can be multifunctional and flexible, facilitating the broad range of uses that may be required over its lifetime
- how the facility can support out-of-hours community use.

Ensure:

- the design prioritises school activities over community activities
- there is a high-quality connection to an appropriately sized covered entry
- adequate support spaces and services are provided to support a multifunctional hall
- halls are near the public interface of a school.

### 2.12.8 Gymnasiums

Gymnasium (gym) space is usually for physical education, sporting activities, and sometimes large school gatherings. Gym spaces should be located adjacent to sports courts and fields. If possible, consider adjacency to school access points for ease of extracurricular and community use.

When planning, consider:

- what amenities are needed to support a gym
- whether teaching spaces are desired within a gym facility.

Ensure a gym:

- is fit-for-purpose and usable for a range of activities
- has adequate court run-off space for safety reasons.

**Indoor Court Dimensions**

Indoor courts are to be dimensioned to community sport standards. Table 20 provides floor area dimensions for indoor playing courts. The dimensions are not appropriate for national level sports activities. Any requirement to provide a facility for sport above community grade is to be agreed by the Ministry and designed appropriately.

If a gym is not being built to accommodate full-size courts, ensure it is located and designed to support future extension to a full-sized gym.

Table 20: Single gymnasium dimensions for school and community sport

| Area | Dimensions |
|---|---|
| Largest court requirement | 30.5m x 15.25m |
| Overall clear area required for playing area and run-off. | 34.5m x 19.1m |

## 2.13 Support Spaces

### 2.13.1 Administration

Administration (admin) areas provide a range of functions. Broadly, these functions are arrival and reception, space for staff to carry out their work and student support spaces. This section outlines our priorities for admin areas.

### 2.13.2 Arrival and Reception

This area is often the first point of contact; a welcoming area for the public, whānau and community.

Consider:

- adjacencies with other facilities, such as parking, halls or libraries
- the operational needs of reception and other adjacent spaces
- any spatial requirements for circulation, waiting or display.

Ensure:

- reception is front of house, at the main entry to a school
- there is sufficient access for, and ability to manage, deliveries and visitor sign-in
- entry is welcoming and provides opportunities for expression of a school's identity and culture
- appropriate spaces are provided for private meetings with whānau or external agencies.

### 2.13.3 Whānau Spaces

Ensure schools have authentic spaces that promote whānau engaging with the school and its community. Provide:

- spaces where whānau could informally gather for tea or coffee with teachers or other members of the school community, and
- spaces with an appropriate degrees of privacy.

### 2.13.4 Staff Spaces

Staff spaces can be distributed throughout the school. When planning, consider staff numbers and the connections that staff need to have.

Ensure admin spaces:

- promote collaboration and social connection among staff
- are flexible and adaptable
- avoid single-use purposes and minimise single-person rooms
- Explore opportunities for some staff spaces to provide additional community or learning space amenity by connecting with other spaces.

## Table 21: Staff generally need spaces for the following functions

| | |
|---|---|
| **Admin tasks** | Design to support social and collaborative work environments. |
| **Leadership** | Space for senior leadership in schools. These spaces should support collaborative management. |
| **Teacher workspaces** | These spaces can be near teaching and learning areas or centralised depending on school needs. Look to combine workspaces where possible. For optimal use of space, avoid providing a desk space for each staff member. Provide storage space and a flexible desk arrangement.<br>Consider staff needs for internal assessment, preparation and marking, resource storage and collaborative professional development.<br>Ensure staff spaces are designed to breakout space standards with high-quality connection and some oversight. Some staff will require visual privacy and retreat spaces, which can often be provided through glazing manifestations or blinds. |
| **Private meetings** | Provide acoustically private meeting spaces adjacent to public and staff spaces. |
| **Collaborative meetings** | Explore opportunities to have occasional meetings within libraries, classrooms, large breakouts, or staff spaces. Minimise single-purpose meeting spaces that will have low utilisation. |
| **Staffroom** | Consider staffroom size and amenity requirements based on likely occupation.<br>Consider staffroom location based on:<br>• access throughout the school, and access to a reasonable outlook or outdoor space<br>• whether staff wish to have passive oversight of the school. |
| **Staff facilities** | Consider toilet, shower, and personal belonging storage spaces. Look to promote active transport.<br>Ensure hygiene facilities are placed in appropriate locations. |

### 2.13.5 Student Support Spaces

These spaces support learners in a variety of ways.

Schools with older ākonga generally have higher requirements for these spaces

Table 22: Support space considerations

| | |
|---|---|
| **Health room** | Health room (sick bay) provision must be adequate for a school's Masterplan roll.<br>Consider:<br>• proximity to a refrigerator for potential medication storage<br>• how multiple unwell students can achieve acceptable levels of privacy, when required.<br>Ensure:<br>• passive oversight from regularly staffed areas<br>• privacy from public spaces, and other ākonga<br>• accessible space for bed/s or recliners, storage joinery and bench, and handwashing facilities<br>• direct access to a toilet and shower. Ensure dignity and privacy when moving between the sick bay and toilet. |
| **Health professional space** | Consider if schools need to provide space for visiting health professionals. Consider utilisation levels when deciding whether a dedicated or shared space is needed. |
| **Pastoral care/ student service spaces** | Explore how pastoral care or student service spaces occur in the school. Any dedicated spaces should be easily accessed and highly connected to learners.<br>Consider how vulnerable students could comfortably approach support spaces without fear of stigmatisation. Our preference is for:<br>• routes that do not signal where a student is headed, and<br>• wait spaces that offer some privacy. |
| **Learning support spaces** | Learning support spaces are to be integrated and connected. Standalone facilities are to be avoided. |

### 2.13.6 Resource Spaces

Resource space is to be prioritised towards equipment storage for learning activities. Activities such as specialist learning, performing arts and physical education have high demands for resource space.

Consider:

- how multiple groups can use change facilities
- how personal belongings can be kept secure
- an adequate number of toilets and showers
- if out-of-hours access may be needed for change space and toilets by for sports field users.

Ensure:

- facilities are inclusive and offer change space for all school users
- toilets are accessible should change rooms be locked
- facilities can easily be made secure if change space and toilets will be used out of hours.

Ensure:

- resource storage is directly available to learning spaces
- sufficient area is allocated for resources to preserve the functional learning area
- planning is efficient in terms of space allocation and the dimensions provided
- standalone resource storage rooms are minimised. Look to integrate storage with other spaces, such as learning or teacher workspaces.

### 2.13.7 Student Cafeterias

Where provided, ensure these are located centrally and are connected, climatically pleasant, social outdoor spaces.

Explore how these spaces can:

- easily receive frequent deliveries
- be located to support cultural or community activities.

## 2.14 Amenity Spaces

### 2.14.1 Toilets

High-quality toilet design is critical for providing learner wellbeing, dignity and equity.

Provide:

- student toilets in numbers to meet the functional needs of a building and its expected use. As a guide to numbers:
  - use the Building Code's toilet calculator for each new building
  - balance toilet provision against school-wide numbers to avoid excessive toilets, taking into consideration whether existing toilets meet Ministry priorities. —discount toilets that do not meet Ministry requirements and are likely to be removed as part of a long-term plan
- toilets that can be used by staff when distance to staff admin toilets are too remote.

Ensure all toilets:

- are well distributed to:
  - provide learners with more than one nearby option – avoid large groupings of toilets
  - minimise disruption to learning – generally, each group of learning spaces is required to have direct access to toilet facilities
- have quality connections to learning and primary outdoor areas, with dual internal and external entry where possible
- have lobbies with high-quality passive oversight from indoors and outdoors
- are private and self-contained, capable of being labelled unisex
- have vandal-resistant fixtures and fittings.

Refer to the Toilet Reference Designs for more detail on our standards.

**Accessible Toilets**

In the context of schools, accessible toilets do not always mean toilets to NZS 4121 standards. For learners of a primary school age, the preferred accessible toilet height for learners can be 400-420mm.

For primary schools, designers must aim for the minimum Building Code requirement for NZS 4121 accessible toilets (these are acceptable for young learners - but should be concentrated where staff and members of the public may be) and maximise the number of age-appropriate accessible toilets distributed within learning spaces, especially where juniors are likely to learn.

**Accessible toilet quantities:**

At least one accessible toilet is required for every group of toilets. Standalone toilets are to be accessible where possible.

In gyms, provide at least two accessible toilets adjacent to changing areas. Project teams must consider what is an adequate level of provision to support gender-neutral and accessibility toileting, showering and changing needs.

Showers should be included when accessible toilets are located in:

- changing room areas
- staffroom areas
- sick bays.

**Universal Bathrooms**

Explore whether a universal bathroom is required when planning a project. It is expected that schools provide at least one universal bathroom within their long-term plan. If a universal bathroom is not required, discuss how one could be easily retrofitted if required in future.

When required, locate the bathroom central to learning as part of a toilet hub. The preference is for a universal bathroom to be within the largest learning facility within a school, or as part of a learning support hub. Avoid locating universal bathrooms in administration buildings or in peripheral buildings away from the centre of a school.

Additional universal bathrooms may be needed in a school where a learner needs to travel more than 150m on the same level or 120m between floors.

Refer to the Universal Bathroom (USB) Guidelines for more detail on our standards.

#### 2.14.2 Administration Toilets

Ensure toilets are available for public use, sick bays, and staff.

#### 2.14.3 Gym Change Facilities

Locate change facilities to enable users to move easily to the gym, outdoor sport areas or other facilities in the school.

Consider:

- how multiple groups can use change facilities
- how personal belongings can be kept secure
- an adequate number of toilets and showers
- if out-of-hours access may be needed for change space and toilets by for sports field users.

Ensure:

- facilities are inclusive and offer change space for all school users
- toilets are accessible should change rooms be locked
- facilities can easily be made secure if change space and toilets will be used out of hours.

#### 2.14.4 Showers

Where specified, showers are to be private and self-contained. Planning must provide reasonable inclusive access to showers.

#### 2.14.5 Bag Storage

Plan for bag storage where required. Consider the educational needs of each space and provide appropriate design for storage of student items.

External bag storage should be all-weather and not negatively impact the envelope of a building, circulation routes or outdoor spaces.

Internal bag storage spaces should be safe and not impede circulation routes, block area oversight or impact on space for learning.

#### 2.14.6 Service Space and Plantrooms

Space for switchboards, ICT and plant is to be minimised. Locate plant and services in marginal areas that do not impact on education, building performance or connectivity.

Avoid the creation of standalone rooms for services infrastructure where not necessary.

Where possible, consider placing service infrastructure in:

- secure joinery with vision panels
- combined rooms with other services or resource spaces
- spaces under stairwells.

Ensure advice is sought early for the sizing and location of service spaces and outdoor plant. Locating plant on roofs must be avoided.

#### 2.14.7 Cleaners' Facilities

Cleaner cupboards can be rooms or a secure joinery cabinet with waterproof tray using adjacent sinks or tubs. Selection must be appropriate to the size and needs of a building and school.

Ensure cleaners' facilities have:

- lockable storage for cleaning products
- an ability to fill and empty mop buckets nearby.

### 2.15 Site Infrastructure and Ancillary Buildings

Ensure infrastructure and ancillary buildings:

- minimise impact on the quality of usable space and do not impact on long-term planning
- are placed in safe-to-access areas
- are located to support coherent and coordinated in ground service routes, in line with a school's long-term Masterplan.

If any infrastructure item is not solely managed by a school then it is best to put this infrastructure roadside for ease of access reasons.

#### 2.15.1 Caretaker and Maintenance Facilities

Ensure a school has adequate support spaces for caretaking and maintenance requirements. Caretaking facilities must be located adjacent to service access areas.

#### 2.15.2 Non-Ministry funded Facilities and Landscape Projects

School facilities for delivering the curriculum take priority over non-Ministry-funded facilities. All facilities, regardless of funding source, are to meet all Ministry site planning standards.

A non-Ministry facility or landscaping feature must not impact on a school's long-term plan, or ability to expand in the future.

# 3 Technical Standards for School Property

This section of DSNZ focuses on:

- the functional and performance standards for the physical elements that make up a school site or building
- clarifying our priorities for educational assets.

The Ministry has a number of additional published technical standards and guidelines to support the DSNZ. These documents are referred to throughout this section rather than repeating the information here. Design teams must refer to our wider suite of technical standards to gain a clear understanding of Ministry standards.

For brevity, the interdependencies between technical elements are generally not outlined explicitly in this document. It is expected that design professionals understand and consider all system and component interdependencies to achieve balanced outcomes.

## 3.1 Sustainability

Planning and design must support school property being fit-for-purpose, durable, adaptable over a lifespan, and environmentally sustainable. Design teams must take a whole-of-life approach to carbon, cost, durability, and maintenance to support value-for-money investment decisions.

The Ministry expects all projects to meet wider government sustainability objectives and carbon targets. Listed below and throughout this document are our standards and priorities for sustainable school property above and beyond wider government requirements.

**Adaptability**

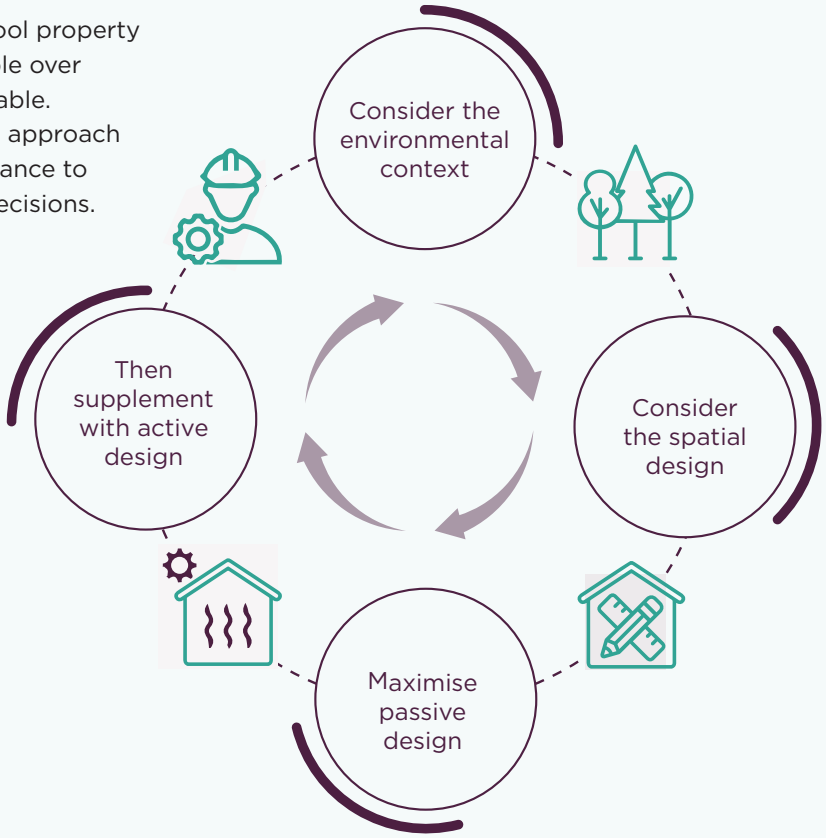
Design teams must ensure that buildings and building systems allow for easy retrofit, addition, or reconfiguration with minimal impact. Priority must be given to ensuring that the design of the structure, building enclosure and building services promote easy adaption in future.

**Resilience**

Schools, and the materials specified in schools, must be designed for long-term resilience to the environment, climate change and expected day-to-day user demands.

**Durability**

Design teams must consider durability and maintenance requirements for building systems and materials and ensure they are fit-for-purpose, long-life and easy and cost-effective to maintain.



### 3.1.1 Prioritise Environmentally Responsive Design and Passive performance

The design process must first maximise passive design solutions before considering active engineered solutions.

Environmental strategies must support wider Ministry objectives around durability, maintenance burden and building performance.

**Respond to Environmental Conditions**

Design teams must understand the site conditions, climate, and surrounding context to inform the basis of a design. They should maximise the benefits of the natural site and avoid costly, high-impact outcomes where practical.

Site plans and buildings must sustainably respond to:

- site topography and orientation
- climate change risk and natural hazards
- sun path, wind and local climate
- site hydrology.

### 3.1.2 Whole-of-life Environmental Impact

A design must minimise its whole-of-life environmental impact whilst balancing the priorities of financial impact, functionality and durability.

Site or project constraints may make achieving Ministry targets challenging. For these projects, project teams are expected to provide analysis of options to the Ministry to inform decision making.

**Minimise Embodied Carbon**

To minimise the impacts of whole-of-life embodied carbon, the design (process) must aim below Ministry targets for embodied carbon through considered design optioneering material selection.

*Product Selection*

Prioritise systems and materials that:

- minimise cost and the complexity of service and maintenance, and servicing, and
- are long-life and maintainable or repairable over the life of an asset.

Locally made products and systems are preferred, providing their performance is comparable with any alternatives.

Avoid waste and materials that cannot be recycled when there are better alternatives.

### 3.1.3 Operational Carbon

Design teams must ensure:

- building systems minimise energy consumption and achieve or exceed Ministry operational energy-use targets
- maintenance requirements for buildings and sites are minimised.

**Maintenance and Service Cycles**

For maintenance and service cycles, design teams must:

- specify materials and systems with lasting performance, avoid materials with short maintenance and renewal cycles
- minimise the specification of active mechanical systems that require scheduled servicing and maintenance
- keep specified systems to a minimum
- ensure related components and systems have similar renewal and service cycles to foster lower maintenance costs
- ensure that, if a building material has a shorter lifespan than adjacent materials, this material can be easily maintained or renewed without impacting adjacent materials or fixtures.

**Operational Waste**

Ensure waste management provision supports the minimisation of waste to landfill.

**Passive Design**

Passive design must be maximised before active design solutions are implemented.

Design teams must ensure:

- passive systems, such as natural cross-ventilation, external shading and night purge are maximised before considering technical or mechanical solutions
- low-tech, easy to use and maintain solutions are prioritised over complex high-tech solutions
- the daily use of passive systems is promoted in preference to active systems
- learners can operate the passive systems in their spaces.

**Active Design**

When designing active systems:

- designs must respond to the context of school demands and environmental conditions — for example, schools are occupied only during daytime hours and may have doors open for long periods, for circulation reasons and to connect to outdoor learning spaces
- for cooling, the preference is for simple systems that promote airflow as opposed to air conditioning
- simplify active systems as much as practical to ensure ease of use by teachers and students — ensure the context of a school's staffing structure is considered when designing systems as not all schools have technical property staff
- prioritise systems that require minimal servicing and programmed maintenance during their operational life.

### 3.1.4 Minimise Environmental Harm

Design teams must specify materials that minimise or eliminate harm to the environment and people.

**Volatile Organic Compounds (VOCs)**

VOCs in materials are to be minimised, especially for indoor building materials.

All products must be certified as containing low levels of VOC. Where comparable products perform equally, design teams should select products with the lowest VOCs.

**Perfluoroalkyl and Polyfluoroalkyl (PFAS)**

Materials and products that contain PFAS compounds or similar 'forever chemicals' must not be used in schools.

**Sustainable Building Materials**

We support the use of sustainable and responsible building materials. Designers must:

- choose environmentally responsible materials where there is an ability to do so
- request Environmental Product Declarations (EDPs) from suppliers
- explore the use of recycled and reused materials and look to divert materials from landfill where practical.

## 3.2 Landscape

Ensure landscaping is:

- adequate for outdoor learning and passive recreation needs
- age-appropriate to inspire play, exploration, and social gathering
- supportive of wellbeing
- accessible and functional, where it needs to be
- sustainable and ecologically friendly
- low maintenance.

### 3.2.1 Site Ecology and Natural Environment

Protect and enhance existing ecology and natural environments and explore how opportunities for learning and recreation can occur.

Look to:

- protect and enhance natural waterways and any ecologically significant areas
- retain existing established trees where possible (especially native)
- consider opportunities for learner interaction with the local ecology and natural environment
- maximise native grass and plant species that are drought tolerant
- minimise the disturbance to and enhance the natural environment.

### 3.2.2 Structures and Fixtures

Ensure landscape structures and fixtures:

- support learning and social interaction through thoughtful layouts for seating, ledges
- support age-appropriate play
- give clear widths as required for circulation
- are not fixed to buildings without evaluation of structural, weathertightness, or maintenance access impacts
- are designed to support vehicle access for emergencies, deliveries, and maintenance
- prevent climbing access to restricted areas such as roofs or other hazardous areas as roofs or other hazardous areas.

### 3.2.3 Fencing

Fencing design must consider safety, community accessibility and inclusion. Where practical, explore landscape design as a first approach to achieving safety outcomes.

When specifically required, ensure fencing:

- prioritises access for learners, community and whānau into and throughout schools — preference is to place school safety fencing at the interface between the learning campus and the entry areas, to support the school having a welcoming main entry
- does not create bottlenecks or pinch points on primary circulation routes, that means, no narrow gates for the main entries into a school
- promotes passive oversight and CPTED principles where appropriate
- promotes safe vehicle and pedestrian movement and provides clear sightlines where needed for safety — solid fences cannot be used where a lack of sightlines may adversely impact pedestrian safety
- is not easily climbed from the school side, and will not cause harm to someone climbing over
- has less than 100mm clearance to the ground, to prevent crawling underneath
- enables easy ground maintenance through mowing strips, and considered placement
- discourages graffiti.

## Table 23: Fencing standards for schools

| Area | Minimum Standard |
|---|---|
| Boundary fencing between other property and a school | A minimum 1.8m fence that provides visual privacy.<br>Ensure higher fences are used where needed to meet fitness-for-purpose standards. |
| Fencing between public spaces and school for student safety, or to provide protection from high-risk areas | The fence must be transparent to support high-quality oversight and visual connection.<br>For primary schools provide a minimum 1.6m fence height.<br>For schools with learners year 7 and above the boundary fence is to be 1.8m high. |
| Noise barriers | Design for noise-barrier fences must achieve our acoustic performance standards. The extent of fencing must consider sightlines needed for CPTED and pedestrian safety reasons. |
| Sport fields for rugby or soccer | Fencing is to be avoided where possible. Provide fencing where required to prevent balls damaging property, being lost, or entering neighbouring property or hazardous areas.<br>Heights must be fit-for-purpose. This can range from 1.2m* to 6m+ high fencing.<br>Ensure adequate entry/exit points are provided to support quality circulation.<br>*1.6 or 1.8m is the minimum height if this fence is also a school's safety boundary fence |
| Hard courts within schools | Hard-court fencing is only expected for:<br>• tennis-specific hard courts, or<br>• to prevent balls entering a hazardous area nearby. |

| Area | Minimum Standard |
|---|---|
| Swimming pools | Swimming pools must be fenced to 1.8m with a preference for oversight into a pool area. |
| Separating vehicles from pedestrians | 1.2m. If the fence is also a boundary fence then follow the boundary fencing standards. |
| Pedestrian gates | Ensure pedestrian gates are:<br>• are appropriately sized to accommodate pedestrian volumes<br>• located for high-quality oversight during school hours, where possible<br>• inclusive, accessible and usable from both sides at all times, subject to safety needs<br>• designed to automatically close, with hold-open latches provided. |
| For specific learning support outdoor areas, if required. | Provide a 1.8m transparent fence with vertical rails.<br>The full fence perimeter must be visible from the learning support space.<br>Gates must connect any fenced area to a school's outdoor spaces.<br>Gate latches must support free access from the outside in. The inside latch should have the ability to lock on occasions. Discuss specific requirements with learning support staff. |

**Welcoming schools enable whānau and communities to easily engage and connect with a school**

#### 3.2.4 Playgrounds and Play Equipment

Ensure playground and play equipment:

- supports creative free play and exploration
- is age-appropriate
- meets best practice standards for safety, design and accessibility
- is reasonably easy to relocate if required
- is low maintenance.

#### 3.2.5 Outdoor Seating

Outdoor seating must be arranged to support social interaction and learning.

The amount of seating in a school must be appropriate for a school's functional needs. Seating must be prioritised around:

- learning, socialising and eating areas
- accessible routes and entry areas to a school
- outside buildings likely to be visited by whānau or community.

Maximise opportunities to incorporate seating by using level changes, the built environment and landscaping. Look to provide some seating that is all-weather.

#### 3.2.6 Drinking Taps and Fountains

School users must have easy access to drinking water during learning and breaks. Drinking water provision and fixtures should be evenly distributed near learning and recreation areas. A mixture of indoor and outdoor water supply is expected.

Ensure external drinking fixtures are:

- age-appropriate, accessible and easy to operate for learners who have low strength
- vandal-proof
- clear of circulation routes
- suitable for filling bottles
- not fixed to building claddings, where possible.

Water supply does not need to be filtered nor do fittings need to be high-end specification. Simple, functional and accessible are the priorities.

## 3.3 Building Enclosure

The key principles that must be considered when designing the building enclosure are:

- performance, functionality, weathertightness and aesthetics
- comfortable indoor environments, for example, to control noise, temperature and glare
- environmentally sustainable design
- durability and whole-of-life costs
- low-maintenance, cost-effective, easily serviced exteriors.

The technical design of the building enclosure has interdependences with:

- *sustainability (section 3.1)*
- *seismic resilience (section 3.6)*
- *indoor environmental performance (section 3.7)*
- *fire (section 3.8) and*
- *safety (section 3.13).*

#### 3.3.1 Building Enclosure Durability

**Durability**

The building enclosure must be designed to optimise durability and reduce maintenance costs. Consider fit-for-purpose performance and whole-of-life costs, and carbon, when designing and selecting materials.

*High-damage Areas*

In student and public use areas, ensure materials are resilient to direct physical impact, outdoor activities, or vandalism where this is a risk. Design teams must prioritise materials that will retain a reasonable level of appearance with everyday wear.

In high wear areas, avoid dark coatings that are prone to scratches and other defects.

Design to ensure vehicles cannot accidentally impact property. Our preference is to keep vehicles away from buildings. Where this is not possible use landscaping, wheel stops, bollards or protective barriers.

*Edge Protection*

Edge protection must be included for claddings vulnerable to impact damage. Specify edge protection for all vulnerable edges within 2m of ground level.

*Natural-finish Timber*

If considered as part of a building enclosure, designers must evaluate, early in design, whether

natural-finish timber is appropriate and will achieve the Ministry's objectives of durability and low maintenance.

All exposed natural-finish (unpainted) timber must be designed to achieve at least 50 years' durability. A design must not rely on timber treatment alone for durability. Designers must carefully consider detailing, construction, coating and recoating methods, and coating specifications, to ensure a durable timber structure and building enclosure.

All end grain of timber, and areas that cannot be accessed for recoating, must have flashings and/or a high-build resilient coating.

All coatings to timber must be an impervious moisture barrier with a maintenance cycle of 10 years plus.

**Life Expectancy and Service Periods**

Design teams must:

- minimise maintenance requirements and maintenance cycles by avoiding components and systems with frequent, complex, or costly maintenance requirements
- ensure related enclosure components have compatible service periods. That is, roof and wall cladding materials should not have different maintenance or renewal cycles.
- consider replacement methodology and cost. Replacement of a material at the end of its life must not require:
  - extensive removal or damage to a material with life remaining
  - the need to decant a facility.
- specify building enclosure systems that are proven to have a reputable service history and are likely to be available for repair and replacement reasons into the future.

### 3.3.2 Weathertightness Standards

The design of the external envelope must meet all mandatory requirements as set out in our *Weathertightness Design Requirements* document.

The enclosure design of school buildings must follow first principles. Designers must take a risk-averse approach to weathertightness by assuming that:

- sealant will fail
- joints will move and open over time
- moisture will be driven by wind and air pressure
- moisture will find and absorb into permeable edges and surfaces.

Enclosure design and detailing must provide proven secondary protection where risks are identified.

Our preference is for complete systems and proven or best-practice detailing that has been tested and certified. Avoid using non-standard details.

Any deviation from standard detailing must be supported by product manufacturers or a building enclosure design specialist.

**Out of Scope**

The following projects require specialised expertise in enclosure design, which is generally beyond the scope of our *Weathertightness Design Requirements* document:

- Buildings with increased environmental loads or complexity, for example, multilevel buildings, curtain wall façade systems, buildings with high environmental risk from wind and moisture and high-performance passive enclosures.
- Maintenance or weathertight remediation works.

These specialised projects must still achieve the performance outcomes outlined in this document, through specific design by a suitably qualified designers.

**Façade and Roof Complexity**

Design teams must aim to reduce the complexity in façade and roofs. Design must:

- minimise the number of different systems used for cladding to reduce complexity
- simplify building forms and junctions to improve buildability and reduce risk.

Design teams must consider an enclosure-penetration strategy early in design. Coordinate service placement within facilities to minimise penetrations that are complicated, exposed to weather or generate extensive flashings.

**Rainwater Management**

Rainwater systems must be designed so that any failure occurs beyond the building enclosure. Design so that overflow and blockage will be immediately noticed by a passer-by to a building.

Internal gutters are not permitted. Exceptions to this are large, multistorey buildings where specific design is required.

Rainwater heads and downpipes must be external to the enclosure. Failure or overflow must not allow water to run down a façade or into an enclosure.

Ensure:

- external spouting has a minimum fall of 2mm per 1m
- external support brackets are used with maximum bracket spacing of 600mm for spouting 180 to 300mm wide
- spouting is coated both sides
- overflows to exterior spouting and rainwater heads are one of the following:
  - overflow over lower front edge, or
  - overflow slots in front face; or
  - spouting installed on packers to achieve 10mm gap between fascia and gutter (this is only permitted where there are eaves)

Spreader pipes discharging over lower roofs are not permitted as blockages are not easily apparent.

**Building as Retaining Wall**

For weathertightness and structural reasons, buildings must not have earth levels above floor level. Retaining walls must be a separate structure from a building enclosure. Ensure adequate space is allowed for future maintenance access needs.

**Shelter for Building Entries and Window Openings**

Entry points and window openings that are required for:

- primary or secondary circulation
- outdoor learning connection, and
- ventilation

must be sheltered sufficiently for functional all-weather use.

**Accessible Door Thresholds**

Ensure door thresholds on accessible routes are weathertight and compatible with mobility access requirements.

**Cultural Panels and Taonga**

Culturally significant carved panels, barge boards or pou must not form part of a building's structure or enclosure. This is to support maintenance access, durability, and to ensure taonga can be retained beyond the life of a building or relocated if desired.

**Fixings to Façades**

Design teams must aim to eliminate fixing into façades where possible. Items such as water fountains, outdoor fixtures, or bag storage should not be fixed to or against a façade.

Ensure items that must be fixed to a façade do not increase the risk of failure to the enclosure or prohibit maintenance. Penetration through the primary weathertightness layer of the building must be avoided.

Any attachments to a building must:

- be considered early in the enclosure and structural design
- not trap undue moisture and allow moisture to dry
- allow for easy maintenance.

### 3.3.3 Sheltered Fenestration

To achieve our performance standards for daylighting and passive performance, designers must coordinate fenestration with passive protection from excessive direct sun.

The priority is for glazing that is facing direct sun to be shielded in order of preference by canopy cover, screens or louvres. Patterned opaque films or glazing treatments that reduce light transmission are not a preferred solution for solar control.

Ensure screens or louvres do not impact on easy maintenance access. Any screen or louvre that needs removal for routine maintenance must be easy for contractors to do.

### 3.3.4 Seismic Performance and Compatibility

Design all enclosure components for compatibility with seismic drift and deflections as specified by the project's structural engineer.

### 3.3.5 Thermal Performance

Design to optimise thermal performance during the main occupied times of the day.

Design teams must aim to minimise the energy required to achieve thermal comfort and air quality during the daytime hours of a school building.

**Light Reflectance and Heat Absorption**

Design teams must consider the impact of radiant heating or cooling through a building enclosure as part of evaluating thermal performance. Avoid using dark colours where this is likely to generate internal heat gain.

The design should ensure enclosure materials and nearby surfaces, including hardstand, do not produce excessive glare or reflected sunlight that could impact user comfort. Also consider glare impact on neighbouring buildings.

An acceptable Total Solar Reflectance (TSR) range for roofs is between 20–57%.

### 3.3.6 Glare and Solar Gain Control

Our preference is for external shading and careful design to manage indoor environmental performance.

**Blinds**

Our preference is to not use blinds for solar control due to their impact on oversight, daylight, ventilation and outlook. Explore alternative solutions before using blinds for glare control.

Blinds must not:

- be expected to manage glare for more than two hours of a school day
- interfere with ventilation, or
- impact passive oversight to outdoor learning spaces.

Consider:

- where blinds will be required for light control or occasional privacy and ensure design supports these needs
- the specification of blinds. Select blinds that support user needs and minimise heat gain. For blinds exposed to direct summer sun, specify light colours to reduce thermal gain.

### 3.3.7 Thermal Bridging and Interstitial Moisture

Design teams must use strategies to mitigate the risks of thermal bridging and condensation appropriate for:

- the local climate
- the commercial systems and materials used in schools, and
- the higher moisture loads generated in schools by occupants.

The design must:

- minimise heat loss or gain from thermal bridging
- eliminate aggravated thermal bridging
- eliminate any risk of interstitial condensation.

### 3.3.8 Roofs

Warm-roof systems are our preferred solution to prevent aggravated thermal bridging and condensation risk in roof spaces. Warm roofs also offer benefits for thermal and acoustic performance.

Traditional cold roofs can only be used if certain criteria are met — these are outlined in our Weathertightness Design Requirements.

Ensure warm-roof selection considers the Ministry's ease of maintenance, cost of maintenance, and environmental objectives.

**Metal Roof Durability**

Metal roofs must be a minimum of 5 degrees pitch. If a roof is to be accessed, sheet metal roofing must be:

- designed to resist damage from reasonably expected foot traffic point loads.
- trapezoidal rib or trough section if the pitch is under 12 degrees
- 0.55 BMT thickness.

Corrugated iron is only permitted on roofs where the pitch is >12 degrees and will not be accessed frequently. Corrugated iron must be 0.55 BMT thickness.

Metal roofs that are exposed to high frequency access for maintenance reasons, or cannot be provided at 0.55BMT thickness, must have roof walkway systems installed as needed to protect the roof from damage.

*Aluminium Roofing*

Aluminium roofing is only permitted where steel would not be warrantied. Aluminium roofing is to be 0.7mm minimum.

**Membrane Roofing**

Membranes are appropriate where roof pitches cannot achieve 5 degrees. Membranes must be

resilient to substrate movement and not have a performance history of becoming inflexible with age or having adhesive failures at lap joints or junctions.

Membrane materials must be either:

- 2-layer torch-applied reinforced modified bitumen membrane with mineral chip finish, or
- synthetic plastic sheet membrane with welded joints: TPO, KEE or PVC.

### 3.3.9 External Joinery and Glazing

External joinery and glazing must:

- be robust and suitable for commercial high volume use, this includes hardware
- be easy to operate for school users
- support our daylighting and thermal performance expectations
- support our sustainability and durability objectives.

**Doors**

Ensure doors achieve all functional requirements as expected. Our preference is for hinged and sliding doors. Bi-fold doors must not be used.

Ensure doors:

- are operable with minimal force and are fit-for-purpose
- have adequate durability and safety features, such as handles, kickplates and vision panels where appropriate
- meet our door hardware expectations (section 3.4.7).

*Sliding Doors*

Our preference is for single leaf sliders to maximise usability and durability.

**Window Joinery**

Designers must ensure windows can be opened and closed from inside without requiring a stool. Windows above door head height will require consideration of the hardware to ensure windows can be easily closed.

Low window openings must not be placed where it is likely that furniture placement will restrict usability.

Our preference is for windows to be designed as:

- top or bottom hung casement stays, or
- sliding windows, ensuring that safety and security are considered.

Side-hung windows must only be used if fully sheltered from prevailing weather. Narrow side-hung windows are to be avoided because of reduced glazing ratios.

Bi-fold windows must not be used.

*Window Hardware*

Ensure window hardware is durable and allows users to control the degree of opening, from ‘cracked’ to full extension (except where safety precludes this).

Ensure design specification that prevents safety from falling and promotes maximum passive ventilation. For ventilation reasons, our preference is to ensure windows can open to their maximal opening area.

Our strong preference is for manually operated hardware positioned within a learners’ reach.

If specifying mechanical or automated window opening hardware, ensure durable low maintenance systems and simple, accessible user controls.

**Glazing**

Ensure glazing specification holistically considers winter and summer thermal performance, solar gain, glare and daylight, acoustics and door weight.

Consider that a learner should be able to operate a door within their space.

### 3.3.10 Verandas and Decks

Ensure veranda and deck surfaces are durable and slip-resistant when wet. Avoid using coating systems that require ongoing maintenance to achieve slip resistance. Designers must pay particular attention to surfaces where direction changes and running are possible.

### 3.3.11 Bird-proofing

Designers must not create bird-gathering perches under covered areas or on façades, or promote nesting. Where this is unavoidable, consider if bird-proofing measures should be installed.

## Table 24: Recommended ceiling heights for schools

| Space | Recommended Ceiling Height (m) |
|---|---|
| Service areas | 2.4m<br>3m for universal bathrooms |
| Primary school halls | 4m clear height at the lowest point. Take into consideration the range of uses, proportions and size of the hall and performance-space needs and acoustic requirements. |
| Senior student sports gyms | 7m clear over the:<br>• full area of a volleyball court<br>• centreline of badminton nets<br>• no less than 6.5m elsewhere over a marked court.<br>Note: Sport NZ's preference for facilities to be used for community competition events is a minimum of 7m, clear of court. The preferred clearance height is 7.5m. |
| General learning spaces | 2.7m – 3m |
| Specialist learning spaces | Adequate height to be fit-for-purpose but minimum 3m |
| Secondary school halls | Ensure heights are fit-for-purpose. Hall spaces require specific consultation and design consideration. |
| Administration areas | Proportional to the size of a space and to support indoor environmental performance.<br>2.7m for offices<br>3m minimum for public spaces |
| Ceiling cavity | Ensure ceiling cavities are of sufficient depth to support future addition of services, taking structure into consideration. |

## 3.4 Building Interiors

School building interiors must support Ministry standards around accessibility, building performance and be fit-for-purpose and durable.

### 3.4.1 Colour schemes

Ensure colour schemes:

- are learner-centred, supporting the creation of a sense of place for learners
- are complementary to learner materials placed on walls
- consider wayfinding universal design principles for low-vision learners, and
- are coherent, to support navigation and wayfinding without heavy reliance on signage.

### 3.4.2 Ceilings

Ceiling specification must meet wider Ministry requirements and be fit-for-purpose.

#### Ceiling Heights

Ceiling heights must:

- be fit-for-purpose without being excessive — high ceilings with no functional value are to be avoided
- support Ministry daylighting objectives through ceiling heights being proportionate to building depth.

The ceiling heights listed in table 24 are the recommendations to achieve reasonable quality of space within a building. Design teams must

consider ceiling heights for each project holistically to ensure quality indoor environments are achieved.

**Sports Facility Ceilings**

A ball or projectile must not be able to dislodge a ceiling component or fixture in a facility intended to be used for ball sports.

**Ceiling Access**

Where access hatches are required, they must be:

- located to support safe and functional access
- dimensioned to support replacement and maintenance of services
- a complete readymade hatch with a secure latch that is durable for commercial use.

Frequently accessed hatches should be located in spaces where a maintenance worker could safely leave their equipment and the hatch unsupervised. It is acceptable if this space can be temporarily closed off, rather than being a dedicated service space.

### 3.4.3 Wall Linings

Wall linings in schools must support our wider requirements around building performance, learning-space requirements, and resilience. Wall linings must be adequate to withstand the everyday use expected for a school environment, whilst retaining a reasonable appearance and not needing regular repair.

**Wet Areas**

For wet areas, consider the:

- resilience of surfaces and junctions that require regular cleaning
- prevention of damage due to moisture from expected use
- selection of materials that are resilient when damp.

Ensure:

- wall surfaces immediately adjacent to sanitary fixtures are impervious and easily cleaned (If a wall surface in a wet area is not likely to require regular cleaning or get wet, a paint finish suitable for commercial wet areas is acceptable.)
- panelised or vinyl wall linings on wet areas have impervious joints and are fixed over a suitable resilient substrate.

**Science and Technology Areas**

Walls must be durable, easy to clean and fit-for-purpose.

Ensure materials selected have an established history for in-service performance, resilience, and appearance retention.

**High-damage Areas**

Use resilient edge and wall surfaces where activities are likely to create impact or appearance damage.

**Resilient Surfaces versus Acoustic Standards**

Where surfaces require both resilience and acoustic performance, material selections must meet both criteria unless NZBC or Safety in Design reasons prevent this.

If the requirement for a resilient surface will impact on acoustic performance, design teams must include compensatory acoustic treatments to meet the Ministry's overall acoustic performance objectives.

**Reduce Painting Maintenance**

Consider including mouldings or dado rails to break up painted walls at locations and heights that have high wear, to allow targeted maintenance of these areas rather than full wall maintenance.

**Cultural Panels or Items with Heritage Value**

Cultural panels or fixtures should be easily removable for maintenance. Ensure there is an ability to relocate taonga without damage.

### 3.4.4 Floor Coverings

Flooring must support broader Ministry requirements for durability, sustainability, safety, ease of maintenance and function.

Our preference is for products with longevity, proven performance and availability on an ongoing basis. Avoid seasonal trends that have limited ongoing supply.

Isolated damage must be repairable to a high quality without full replacement or resurfacing.

In general, flooring should be specified for installation before sanitary fixtures and joinery are fitted, with the exception of shower trays.

**Entry Mats**

Provide a mat at entries to buildings and external lifts.

Mats must be:

- of a depth that is functional to remove debris and water without impacting on the usability of internal space
- be integrated with adjacent flooring with a flush transition
- at least the width of the entryway.

**Soft Floor Coverings**

Soft floor coverings must be:

- commercial grade, heavy-duty carpet tiles expected to retain their appearance
- sustainable with low VOCs
- a reasonably long-standing style and pattern to support ongoing maintenance
- colour-fast and fade-resistant.

Ensure wayfinding and placemaking is considered with flooring selection and design.

Light coloured placemaking colour accents should be kept to a minimum on foot traffic routes or areas or where activities may cause staining.

**Resilient Flooring**

Resilient flooring must be specified where soft coverings are not fit-for-purpose. Sheet vinyl is the preferred solution, where suitable.

Sheet vinyl floors are not suitable for areas where spiked sports shoes are likely to be used (that is, outdoor-sports changing rooms) and in trade-based workshop areas. For these areas, select appropriate resilient flooring solutions.

Sheet vinyl floors must be:

- commercial grade and resilient to the activities in the space
- sustainable and low VOC
- homogenous and seam-welded
- coved upstand with a trim detail to the top wherever mopping is likely to be frequent.

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- sustainable and low VOC
- homogenous and seam-welded
- coved upstand with a trim detail to the top where mopping is likely to be frequent.

**Gym Floors**

Ensure gym flooring:

- is fit-for-purpose for sport and durable enough to meet the building's wider expected uses
- has shock-absorbing properties appropriate for community level sport:
  - If a gym is required to meet national sporting competition standards, the flooring performance must meet the relevant national sporting body standards. Design teams must still ensure overall durability expectations are achieved.
- has a resilient surface finish and resilient court markings:
  - Our preference is for floors that do not require ongoing maintenance coatings.
  - For coated timber floors, our preference is for court markings to be underneath high-build coatings to increase the service period.

**Floors for Multipurpose Space**

Explore durable flooring solutions suitable for multipurpose facilities. The floor in a multipurpose space must tolerate point loads, such as chair legs or stiletto shoes. Our preferred resilient solutions include sheet or tiled vinyl or rubber products, or durable seamless floors.

### 3.4.5 Interior Doors

All doors must be functional and have commercial grade durability. Doors must provide oversight and visibility where required and privacy where expected.

Door weights and door-closer resistance must support easy operation for a building's occupants. Consider universal design principles and the expected strength of learners.

**Hinged Doors**

Hinged doors to occupiable spaces must open wide enough to achieve clear opening width standards.

Door-closing hardware must be surface mounted.

**Sliding Doors**

Sliding doors must be easy to operate, robust and easy to repair. Preference is for simple single sliding doors.

Stacked or pocket sliding doors are not preferred. Where installed to provide necessary connectivity, they must be easy to access for maintenance.

**Glazing**

Ensure internal glazing holistically considers door weight, privacy, oversight, daylighting and acoustics.

**Durability**

Ensure everyday door use will not damage joinery, glazing or surface finishes.

The priority is for the push side of a door to be resilient. The pull side is not required to be protected where damage is considered low risk. Sliding accessible toilet doors require resilience on both sides.

It is not necessary to overprotect doors at low risk of damage. Surface protection is not expected for seldom-used, low-risk doors.

**Operable Walls and Bi-fold Openings**

Operable walls and bi-fold openings must be avoided because of maintenance and performance issues.

### 3.4.6 Hardware

Hardware in schools must be of a durable commercial grade, easy and low cost to maintain or replace.

**Door Hardware**

Ensure door hardware:

- supports universal design, with lever handles only
- does not allow an unauthorised user to lock a building or space from the inside - for security reasons, snib locks must not be used in learning areas
- allow a teacher to lock or unlock exterior doors from either inside or outside in the case of a safety lockdown
- allows free exit and egress from buildings
- is heavy duty commercial grade.

*Toilet Privacy Hardware*

Toilet hardware must:

- have a durable privacy latch with an easy-to-use lever
- display an occupied/vacant sign on both sides of the lockset.

**Locking Systems**

*See security, section 3.12*

**High-use Doors**

Provide:

- additional pull handles as required on high-use doors to reduce wear on door lever handles
- push plates as needed to prevent surface wear from high use.

**Doorstops**

All doorstops must be capable of withstanding slamming door forces. Ensure doorstops are adequately fixed to meet expected door impact and usage.

Hinged doorstops must be located near the leading edge of a door, not the hinged edge.

### 3.4.7 Mouldings and Surface Protection

Materials used to protect edges and surfaces from impact or aesthetic damage must be resilient, low-maintenance and cost-effective. Materials must also be reasonably repairable or replaced if damaged.

Mouldings and skirtings must be durable and resilient for their expected wear. MDF or similar is not permitted.

### 3.4.8 Fixed Storage

When designing fixed storage, ensure:

- durable materials and hardware are used, considering the activities, use levels and environment
- fixing requirements and loads are factored into the design process early, both architecturally and structurally
- cabinet doors over 400mm wide are avoided for reasons of hardware durability.

Consider the following:

- minimise under-bench joinery cabinets. The preference is for fixed benches with free space underneath to accommodate mobile trolley equipment
- place heavy storage on ground floors where possible, to avoid structural design implications.

#### 3.4.9 Benchtops

Benchtops must be fit-fo-purpose. Consider factors such as heat, flames, chemicals, impact and water.

Ensure wet benches against walls have an upstand and/or a splashback

Consider requirements for:

- accessibility
- mobile furniture in specialist spaces, which may need to be the same material as the benches.

#### 3.4.10 Reception Desks

Ensure reception desks and counters support eye contact and interaction between learners, wheelchair users, visitors and staff.

Design considerations:

- the position of any lowered counter must be inclusive
- ensure any wayfinding requirements are based on universal design principles.

### 3.5 Ancillary Facilities

Ancillary buildings that house critical infrastructure must reasonably meet our standards, particularly for site planning, fire, weathertightness and structure.

Ancillary buildings used for storage must meet our site-planning requirements and fire requirements.

#### 3.5.1 Covered walkways

Ensure covered walkways:

- are of simple functional construction using low-maintenance materials— linings to the underside are not required unless for performance or durability reasons
- do not support the ability to run services between buildings (Services must not run through covered walkways.)
- support emergency and maintenance vehicle movements through a site.

### 3.6 Seismic Resilience including Structural and Geotechnical Requirements

A school is a central part of its community and has an important role to play following the occurrence of a natural event such as an earthquake, The Ministry therefore has specific performance requirements above minimum Building Code and are unique to state school buildings. These help ensure schools are resilient, remain useable and are repairable after a significant seismic event.

These requirements extend to non-structural elements (such as cladding, ceilings, partition walls and building services), recognising that these elements often have a greater impact on the repairability and usability of a building after a seismic event.

**Solutions are to support a school's educational needs within the constraints of Ministry property standards and a project's outlined scope of work**

The Ministry's Structural and Geotechnical Requirements (SGR) outline our requirements for structural and geotechnical engineers, and our requirements for non-structural building elements in detail.

Design teams must comply with the requirements outlined in the SGR document when undertaking property work in schools. A summary of the SGR's seismic resilience principles and requirements are outlined below.

### 3.6.1 Seismic Resilience Principles

The key principles that must be considered when designing school buildings are:

- Design flexible, adaptable buildings by minimising structural barriers to internal reconfiguration
- Provide buildings that are likely to remain usable after a reasonably foreseeable seismic event
- Design to enable the repairability of a building within reasonable time frames (e.g. school holiday period) using conventional techniques.

### 3.6.2 Early and Comprehensive Geotechnical Investigations and Reporting

The geotechnical ground conditions can vary significantly across a school site and can have a significant impact on the location, cost and type of buildings that are most suitable. We require comprehensive geotechnical investigation and assessment to be complete well before decisions on Masterplans, building placement or building form are made.

Our requirements for geotechnical reports are detailed in the SGR.

### 3.6.3 Foundations and Settlement-tolerant Buildings

Buildings with shallow foundations such as concrete rafts are more easily repairable, have lower life cycle costs and usually have lower embodied carbon relative to deep foundations such as deep piles. Designers must consider and present a shallow foundation solution as part of their foundation optioneering, where appropriate.

For buildings on ground susceptible to settlement such as soft ground or ground prone to liquefaction, designers are to work through a settlement-tolerant building option in determining the most appropriate foundation solution for the site.

### 3.6.4 Structural and Non-structural Systems

The Ministry has specific requirements for the design of the structural and non-structural systems to ensure improved resilience and adaptability, including:

- drift limitations for the primary structural system to ensure repairability after a significant event (SLS2 loading) and to support continued use
- detailed performance requirements for specific structural and non-structural elements (for example, partitions, suspended ceilings, ventilation systems and emergency power systems)
- requirements for heavy cladding materials such as when using masonry veneer as a cladding system.

All projects that incorporate structural or geotechnical design must clearly outline the design response to our SGR requirements. This is to be conveyed within a design features report.

### 3.6.5 Seismic Assessment and Strengthening of Existing Buildings

The Ministry aims to have all school buildings strengthened, as near as is reasonably practicable, to 67% NBS. In practice, the 67%NBS target should not be a rigid target and there may be some instances where a lower target is appropriate, balancing the need to reduce the seismic risk while ensuring remediation costs are not disproportionately high.

Guidance and templates for undertaking seismic assessments of existing buildings are available on our property website.

#### Planning for Strengthening Work

For buildings above 34% and below 67% NBS, strengthening works should generally be completed as part of other asset management interventions which may include other upgrades such as building refurbishment. This whole-of-asset approach is more cost-effective and minimises extended disruption to teaching and learning.

For buildings below 34%NBS strengthening should be prioritised. In these instances a specific standalone strengthening project will likely be required.

In all cases, a structural engineer should be involved to inform decision making.

## 3.7 Indoor Environmental Performance

This section looks at the internal environment for schools and provides a high-level summary of our Designing Quality Learning Environments (DQLS) series of documents. These cover requirements and technical guidance for lighting, acoustics, indoor air quality and thermal comfort requirements. This section is a summary of our indoor environmental requirements, it does not comprehensively address all areas covered in the DQLS documents themselves. Design teams must refer to the DQLS documents for a fuller understanding of our technical requirements.

### 3.7.1 Lighting and Visual Comfort

This section provides a summary of the Ministry's performance requirements for daylighting and electric lighting in schools. The Ministry's full requirements are detailed in DQLS: Lighting.

**Lighting Design Objectives**

Design teams must use these key strategies to achieve good lighting outcomes:

- ensure balanced, diffuse, glare-free daylight from two or more directions
- ensure spaces have appropriate light levels, and light control, to support functional needs
- provide windows for interest, relaxation, and connection with the outdoors
- provide exterior shading as needed to minimise solar heat gain
- provide electric lighting that is energy-efficient, has a long life, is readily available and requires minimal maintenance.

**Mandatory Lighting Requirements**

Design teams must ensure that school buildings meet the requirements set out in table 25 below.

### 3.7.2 Acoustics

This section provides a summary of the Ministry's mandatory performance requirements for acoustics in schools. The Ministry's full requirements are detailed in DQLS: Acoustics.

Table 25: Summary of Mandatory DQLS lighting requirements

| Description | Lighting Mandatory Standards Explanation |
|---|---|
| Daylighting standards | Daylighting must be the main source of lighting in schools, supplemented by electric lighting when daylight is insufficient.<br>Ensure target lighting levels of 300lx to 2000lx are achieved for all learning spaces. |
| Electrical lighting | All luminaires must be 100% based on LED lamp technology.<br>Provide local controls or switching, including dimmable lighting and task lighting.<br>The technical standards outlined in the DQLS lighting requirements must be met. |
| Compliance requirement | Design teams must demonstrate compliance with the stndards. Compliance requirements vary depending on building form and complexity. |

**Acoustic Design Objectives**

Learning-space design and the way space is used has a significant influence on its acoustic performance. The requirements in this document help to manage noise levels in learning spaces.

Design teams must target these key objectives to achieve good acoustic outcomes:

- have distance between learning spaces and environmental noise sources
- consider environmental noise sources when

locating windows and doors
- avoid locating noisy learning areas adjacent to noise-sensitive areas
- ensure building elements are specified appropriately to achieve acoustic targets
- design spaces with acoustic performance as a priority.

**Mandatory Acoustic Standards**

Design teams must ensure school buildings meet the standards set out in the table below.

## Table 26: Summary of Mandatory DQLS acoustic standards*

| Space | Reverberation Time (RT, in seconds) | STC ratings of walls | Indoor ambient noise levels (dBA LAeq) | |
|---|---|---|---|---|
| | New Build and Refurbishment | New Build and Refurbishment | New Build | Refurbishment |
| Learning Spaces > 300m$^3$ | 0.4-1.1 depending on volume *(see DQLS Page 9)* | STC 50 separate STC 45 connected | 45 | 45 |
| Learning Spaces < 300m$^3$ | 0.4-0.5 Primary 0.5-0.6 Secondary | STC 50 separate STC 45 connected | 40 | 45 |
| Breakout spaces | 0.4-0.5 | STC 50 separate STC 45 connected | 40 | 45 |
| Music rooms | 0.5-0.8 | STC 60 | 40 | 45 |
| Assembly halls | 0.5-1.3 depending on volume | STC 60 | 35 | 35 |
| Office/ teacher workspaces | 0.4-0.5 | STC 45 | 40 | 45 |

*Refer to *DQLS: Acoustics* for full details on all of the Ministry's acoustic design requirements.

### 3.7.3 Indoor Air Quality and Thermal Comfort

This section provides a summary of the Ministry's mandatory performance standards for Indoor Air Quality and Thermal Comfort in schools. The Ministry's full requirements are detailed in DQLS: IAQ and TC.

**Indoor Air Quality and Thermal Comfort Objectives**

Design teams must target these key objectives to achieve good indoor air quality and thermal comfort:

- ensure learning spaces are designed for control by the occupants
- prioritise the provision of fresh air through opening windows
- design must be fit-for-purpose for the expected building uses and occupant numbers
- maximise passive thermal performance, and fresh air ventilation
- use low VOC building materials.

**Mandatory Indoor Air Quality and Thermal Comfort Standards**

Design teams must ensure that school buildings meet the standards set out in table 27 below.

Table 27: Summary of Mandatory DQLS acoustic standards

| Description | Mandatory Standard Explanation |
|---|---|
| Air quality | Ensure the $CO^2$ design target of <1000 parts per million (ppm) will be achieved.<br>New buildings must allow for the dissipation of construction material VOCs before occupation. |
| Temperature | Ensure the Ministry's temperature design targets will be achieved. |
| Thermal insulation | Provide climate zone-specific thermal insulation to support Ministry objectives for operational efficiency and building performance. |
| Ventilation | Our preference is for natural or mixed-mode ventilation (depending on the climate zone). Full mechanical ventilation systems are a last resort and must be supported through modelling and analysis. |
| Systems and components | The installation of new fossil fuel boilers is prohibited as part of the Ministry's commitment to carbon-reduction objectives.<br>The selection of heating, cooling and ventilation systems must be in accordance with our whole-of-life objectives for reducing impacts on the environment and operational costs. |
| Internal environment monitoring (IEM) | A $CO_2$ and temperature display must be provided in a central location within each learning space. It must have instant visible feedback for local users and the ability to store or upload accumulated data. |

### 3.7.4 General Internal Environment Refurbishment Recommendations

The internal environment strategies for upgrade projects are much the same as for new buildings. Design teams must take an 'as near as reasonably practical' approach to retrofit or refurbishment upgrades.

Aim to resolve poor performing spaces and reduce operating costs, where practical. Cost-effective strategies must be used, with a primary focus on areas where upgrade benefits will provide tangible improvements to a learning environment.

All changes to an enclosure or internal building element should be investigated to determine the impact on the quality of the internal environment.

## 3.8 Fire

This section sets out Ministry standardsfor fire property measures. The Ministry has property protection objectives above Building Code requirements for life safety that design teams must meet. These objectives are:

- to not allow fire to spread from one building to another
- to limit fire or smoke damage as near as practical to 800$m^2$ per building
- to have the earliest possible detection of fire 24/7, and
- to have fire services respond in the fastest time possible 24/7.

The preference is for passive fire-protection solutions that minimise ongoing compliance costs. However, our priority is to ensure fire-prevention strategies are achieved without impacting on overarching educational objectives.

If compliance with our standards results in adverse building performance or educational impacts, design teams must use project-specific design to achieve the Ministry's property-protection objectives.

### 3.8.1 Fire Alarm Systems

Ensure new fire alarm systems are connected to a site-wide integrated fire alarm panel that:

- has a single point of access for monitoring and control
- is located for ease of access and in a position agreed by Fire and Emergency New Zealand (FENZ) emergency response personnel upon arrival at site
- is analogue addressable
- has capacity to support expected facility growth.
- is directly connected to FENZ.

## Table 28: Fire alarm types

| Space Use | Required Fire Alarm System |
|---|---|
| Teaching and learning spaces, boiler rooms, plant rooms or buildings that are vital for the operation of the school | Type 4: Automatic fire alarm system activated by smoke detectors and manual call points. |
| Spaces where false alarms through airborne particulates may be prevalent or where deemed appropriate by the fire engineer | Type 3: Automatic fire alarm system activated by heat detectors and manual call points with supplementary smoke detectors. |
| Areas where sleeping will occur | Type 4: Automatic fire alarm system activated by smoke detectors and manual call points should be installed in sleeping areas where no cooking facilities of any kind (including hot plates, toasters, etc) are present.<br>Type 5: Automatic fire alarm system with modified smoke detection and manual call points are required for all other sleeping accommodation uses such as kitchen areas. |
| Caretaker sheds, standalone storage sheds and buildings not vital for the operation of the school | No fire alarm system required |

### 3.8.2 Sprinkler Systems

Sprinklers must be installed for:

- new buildings (or significant alteration of existing buildings) with a floor area over 2,400m$^2$
- multilevel buildings with an escape height above 10m, regardless of the building floor area
- new buildings in schools with an existing sprinkler system that has capacity to accommodate the new build
- specialist base schools, satellite schools and learning support spaces (‘high needs spaces’) that cannot meet the criteria set out below in section 3.8.3
- residential special schools.

Sprinklers are highly recommended where the practice of having school sleepovers is likely to be a key part of the school curriculum. In these cases, ensure the building-use category is accurately defined to support appropriate fire safety design.

#### External Sprinklers

External sprinklers must be included in all new sprinkler installations. External sprinkler specification must consider durability of fittings and prevent vandalism.

### 3.8.3 High Needs Space Fire Safety Design

The following criteria apply for teaching areas designed for high needs learners, both standalone buildings and spaces integrated within a mainstream school. High needs spaces must have:

- accessible wheelchair-friendly exit/s with less than 2m of escape height
- an open-path travel distance of no more than 20m, and
- a FENZ-compliant plan to safely evacuate all occupants to an external place of safety in reasonable time.

If a design cannot achieve all of the above criteria, sprinklers must be installed and a design team

must consider how evacuation can occur safely.

If an integrated high needs space is required to be acoustically separated from the rest of a building, include smoke control doors

### 3.8.4 Fire Extinguishers

Hand-operated fire-fighting equipment is only expected in alignment with health and safety requirements.

Existing extinguishers that are not required (as outlined in table 29) should not be replaced once they have reached their expiry date.

## Table 29: Fire extinguisher standards

| Room Use | Type of Extinguisher |
|---|---|
| Chemical laboratories, hard technology workshops, special needs units, and where sleeping accommodation is provided | Multipurpose dry powder (for combined fire classes A, B, and E). |
| Kitchen facilities | Wet chemical extinguishers suitable for fires involving cooking oils and fats. |
| All other spaces | None, unless required to meet Health and Safety or FENZ requirements. |

Existing extinguishers that are not required (as outlined in table 29) should not be replaced once they have reached their expiry date.

### 3.8.5 Control of Internal Fire and Smoke Spread

## Table 30: Internal fire and smoke-spread compartment size standards

| Description | Maximum Compartment Standard ($m^2$) |
|---|---|
| Buildings with sprinkler systems | Meet NZBC requirements |
| Buildings without sprinkler systems | 800$m^2$ |
| Exemption for halls, gyms and performing arts centres | >800$m^2$ cell is acceptable if compartmentation will disrupt the intended use of the building. Minimise the size of any compartment to the nearest practical partition. |

**Internal Fire Separation Design Standard**

Our preference is for simple low-maintenance, cost-effective solutions to fire separation.

Some options for fire separation are:

- where a solid wall and hinged fire doors on hold-open devices are not prohibitive to education, use an internal fire separation to a two-way fire resistance rating (FRR) of (60)/60/60SM, or
- where visual oversight is necessary to support education, smoke-seal glazed doors and consider drenchers as an alternative to fire rated walls. Design teams must consider whether drenchers are appropriate in addition to smoke separation.

Fire separation is to be designed as expected for NZBC and any applicable fire design standards.

### 3.8.6 External Fire Spread

Design teams must mitigate horizontal fire spread between buildings on a school site. This applies to all buildings that impact on Ministry-owned property, regardless of ownership or how long a building is intended to be on site.

Ancillary, storage or service buildings must be designed, or placed, to prevent fire risk to educational facilities.

**One-building Envelope Principle**

The Ministry has a 'one-building envelope' principle for fire cells. Separate buildings cannot be aggregated into one fire cell.

**In Scope: The 'Imposed Risk'**

Mitigation is generally only required to be carried out on new buildings, or major refurbishments to existing buildings, using the concept of 'imposed risk' (versus 'existing risk'). Fire-spread mitigation is not required to existing buildings where no work is being carried out.

However, all steps should be taken to mitigate the potential for loss caused by the impact of existing assets on new assets of high value. Priority should be given to protecting assets with high value, regardless of whether a building is within scope or not.

Table 31: Determine whether fire-spread mitigation is required

| If the 'imposed risk' is | and | then: |
|---|---|---|
| Single storey | 6m+ from an existing building, | no further action to imposed risk is necessary. |
| Double storey, or a hall or gym >5m height | 10m+ from an existing building, | |
| Designed with a non-combustible building envelope facing other buildings | more than 3m away from another building, | |
| Designed with non-combustible cladding to the façades facing other buildings | sprinklered, | |
| Single storey with combustible claddings | within 6m of an existing building, | use ERM method (see below) to evaluate the safe separation distance and/or the level of passive fire protection required. |
| Double storey with combustible claddings | within 10m of an existing building, | |
| Within 3m of an existing building | both buildings are not sprinklered, | a fire engineer must design two-way protection to prevent fire spread from:<br>• the imposed risk (new build) to existing buildings, and<br>• existing buildings to the imposed risk (new build). |

**The Enclosing Rectangle Method**

To determine the safe distance or level of protection required for schools buildings, follow the enclosing rectangle method (ERM) as set out in the NZBC protection from fire clauses.

Regardless of a ERM calculation, the maximum separation requirement is:

- 6m for single storey buildings, and
- 10m for unsprinklered multistorey buildings.

**Covered Walkways**

Covered walkways must not enable fire to spread from one building to another. Our preference is for non-combustible cladding to be used.

Covered walkways with elements that risk fire spread must not be connected to more than one building.

### 3.8.7 Existing School Upgrades

We expect to eventually upgrade all schools to meet Ministry fire standards. Every project is an opportunity to improve fire performance. It is expected that areas under major refurbishment would fully meet our standards.

Where a partial renovation of a building is taking place, only the area being renovated is expected to be upgraded, with design allowing for upgrade to the remaining portion of the building at a future date.

The extent of fire upgrade is to be decided by the Ministry at a project level.

### 3.8.8 FENZ Liaison

Design teams must liaise with FENZ early to ensure firefighting and evacuation regulations can be met in the proposed built environment.

**Evacuation**

Our priority is for an 'all out' approach to evacuation.

## 3.9 Electrical and ICT infrastructure

### 3.9.1 Electrical

**Site-wide Electrical Infrastructure**

Site-wide electrical supply capacity must be understood for all projects that create additional load. Additional electrical supply calculations must consider:

- demand requirements for the Masterplan and the current project - maximum demand should be calculated assuming sustainable practices, such as energy management and low consumption, as opposed to possible maximum demands
- monthly line-charge cost implications for schools - avoid supplying excessive electrical capacity, and explore load management strategies, where practical
- sustainability requirements and the elimination of any fossil fuel energy onsite
- high-demand, site-specific features, such as water or wastewater pump stations, trade training facilities.

Onsite transformers, substations or large battery energy storage must be in separate secure vandal-proof enclosures that are at appropriate distances from school buildings and neighbours, for safety and noise reasons. Avoid placing enclosures near buildings or neighbours where fire and acoustic requirements will be triggered.

See *section 3.10* for information on site-wide service ducts.

**Requirements for Electrical Infrastructure in Buildings**

Ensure:

- flexibility of building use — locate power points to support teaching and learning flexibility throughout spaces
- adaptability as building needs evolve
- efficient use of energy
- future increase in demand is allowed for
- external power supply is available for outdoor learning or maintenance.

**Mandatory Installation Standards**

AS/NZS 3000 or the Australian/New Zealand Wiring Rules are a mandatory minimum standard for all electrical installations in New Zealand.

*The Electrical Installations: Standard for Schools* document provides the technical standards for electrical infrastructure in all school facilities. The document also provides guidance on minimum standards in the following areas:

- technical standards
- product selection
- design, installation and testing
- labelling, administration and documentation.

**Solar Energy**

Solar systems are most suitable for installation after basic energy-efficiency improvements have been completed.

### 3.9.2 Information and Communications Technology

**Site-wide Communication Cabling Infrastructure**

Designs must allow for potential future changes to technology requirements. Ensure adaptability is considered.

Ultra-fast broadband (UFB) cabling is to be provided where available. Where UFB is not presently available, ducts with draw-cords must be

laid alongside communication cables for the future running of UFB to the defined communications receiving/server room. Ducting runs are to incorporate regularly located draw pits to facilitate the drawing and jointing of future cable runs.

Communication cables are to be run from any instrumentation required as a part of water or wastewater pumping, storage facilities and flow meters.

See section 3.10 for information on site-wide service ducts.

**The Ministry's Mandatory ICT Standards**

Design teams and installers of ICT networking must meet Ministry standards for ICT installations. These are detailed in the following documents:

- **ICT Cabling Infrastructure Policy and Standards for schools**
  - this document details the standards for school generic cabling systems (GCS) and network infrastructure systems.
- **ICT Switching Policy and Standards**
  - this document details the standards for school switching systems and network infrastructure systems.
- **ICT Wireless LAN Policy and Standards**
  - this document details the standards for school wireless LAN systems.

These documents provide information on the following areas:

- technical standards for cabling systems, switching and Wireless LANs
- product selection
- design, installation and testing
- labelling, administration and documentation expectations.

### 3.9.3 Public Address and Safety Warning Systems

Ensure public address systems provide capacity to accommodate:

- fire, lockdown and other safety warning signals as needed for a school
- school bells
- voiced announcements and paging.

Speaker quality and placement must support clear speech intelligibility in learning areas.

**Warning Systems for the Hearing Impaired**

Provide strobe-light alarm systems where required to support the safety of hearing-impaired learners. Priority must be given to spaces where a hearing-impaired person is likely to be alone or only with other hearing-impaired people.

Ensure all newly installed safety systems can support any future addition of strobe-light warning systems for the hearing impaired.

## 3.10 Civil Works and Services

This section covers civil works and utility services clear of buildings. It does not cover services specific to buildings. This section also covers site-wide civil engineering elements.

All civil infrastructure is to be designed to:

- consider site-wide coordination and compatibility of infrastructure
- allow for capacity to accommodate Masterplan roll numbers and any expected community use — future development must not generate reworking or replacement of newly installed infrastructure
- prioritise resilient, sustainable and functional schools
- support easy, low-cost maintenance — routine maintenance should not disrupt education spaces, where possible
- promote student learning around infrastructure and sustainability.

If building management systems (BMS) are likely to be used, ensure the design is compatible.

### 3.10.1 Sizing of Infrastructure

Engineers must consider whether their infrastructure can be expanded to accommodate future growth or is best installed to future capacity in the current project.

If a design to Masterplan capacity incurs significant project costs or is not practical, our preference is for infrastructure to be designed to allow for compatible future expansion where possible. If this is not possible, discuss your design strategy with us for agreement.

**Energy Infrastructure**

Energy infrastructure design must consider the impact of design capacity on monthly line charges.

Our preference is for design to meet current or medium-term demands whilst allowing for additional capacity to be added as required.

#### 3.10.2 Site Service Infrastructure and Plant Rooms

Align plant facility locations with a school's Masterplan and our site-planning priorities. Where there is no Masterplan, ensure discussion about plant locations takes place. If any infrastructure item is not solely managed by a school then it is best to put this infrastructure roadside for ease of access reasons.

Where practical, avoid placing site-wide infrastructure within educational buildings. The demolition of an educational building or structure must not generate costly replacement or rerouting of site-wide infrastructure systems.

#### 3.10.3 Underground Services

All services and cables are to be inground where possible. All inground services must be resilient and generally comply with our property resilience and adaptability principles.

Services must have a design life that exceeds the expected life of the building.

Design teams must consider:

- where any seismic or static movement is likely to occur and design appropriately
- ability to access and repair services following a seismic event — inaccessible services that are critical to facilities and not easily repaired must be designed to a high level of resilience
- Minimising services under foundations of new buildings — where unavoidable, design for resilience and repairability.

Buildings must not be built over existing services unless unavoidable and specifically approved by both the controlling authority and the Ministry. Our preference is to relocate services, unless unavoidable. When services cannot be relocated, affected services must be renewed as a minimum.

**Inground Service Ducts**

Design teams should plan for cabling, heating and cooling, and potable water services to be reticulated and accessed through inground service ducts. Where possible, inground services should be coordinated using site-wide service trenches.

Service locations in new service trenches must adhere to separation distances detailed in NZS4404:2010. Existing service trenches should follow separation distances as near as practicable.

## 3.11 Three Waters

This section covers the design standards for all water services provided to schools, including freshwater, wastewater and stormwater (the 'three waters').

Schools that supply and treat their own potable water and/or manage their own wastewater on-site must meet Ministry-specific minimum levels of service in addition to achieving regulatory compliance. For further supporting information and requirements go to water management in schools.

#### 3.11.1 Potable Water Supply Including Fire Demand

Our preference is that schools receive water from a reticulated network supplier wherever practicable, even if further on-site treatment is required.

System design must ensure that supply is adequate to meet demand based on a Masterplan roll and an allowance for other facilities (based on Ministry design guidelines).

The water supply for fire is to meet the requirements of SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice. Ensure alternative outcomes are discussed and agreed early with FENZ if meeting their standards is not viable.

**Self-supplied Schools: Schools Supplying Their Own Water**

Schools must only supply water to buildings and facilities which are located on school land or where a school has a legal responsibility to service.

System design must ensure water storage is sufficient to:

- provide year-round cost-effective access to water
- maintain continuity of supply in the event of a foreseeable source or treatment outage. For example, a bore pump failure.

System complexity, on-going maintenance and operating costs must be minimised through good design.

Water must meet the drinking water standards as

defined by the maximum acceptable values (MAVs) (and where practicable and not cost prohibitive the aesthetic values) set out in the New Zealand Drinking Water Standards and Aesthetic Values.

Self-supplied school treated water networks must be protected from contamination using backflow devices when justified by risk.

*Irrigation and Outdoor Water Use*

Outdoor water use must be minimised unless a separate (or the main) source is confirmed to be sufficient to meet the additional demand.

Schools must implement demand management of water use by:

- ensuring natural landscaping is drought tolerant
- providing for episodic demand such as pool filling to be met from other sources. For example tankered water
- exploring greywater or stormwater recycling.

**Schools Connected to Reticulated Supplies**

System design must ensure reticulation is sized to cope with:

- normal potable demand
- fire protection, and
- outdoor water use such as for irrigation where potable water is required for establishment and maintenance of soft landscaped areas.

Water distribution networks must be protected from contamination using backflow devices when justified by risk.

**Water Use Efficiency**

Water meters (smart or smart capable) must be installed at the point of supply for reticulated supply connections, or after treatment for self-supplied schools.

Additional meters should be installed to measure water use in separate supply zones. For example:

- on connections to non-ministry owned facilities or facilities that have third party customers e.g. community halls
- in extensive networks with long lengths of water pipe
- where there is potential for significant outdoor water use such as irrigation.

Water fixtures must prioritise low consumption of water and be supported by either:

- a Water Efficiency Labelling Scheme (WELS) water rating, or
- be near best in class for their category, where applicable.

## Table 32: Preferred plumbing fixture WELS ratings

| Fixture | WELS Rating |
|---|---|
| Sanitary taps | 6 Star |
| Toilets | 5 Star |
| Dishwashers | 6 Star |
| Clothes washing machines | 5 Star |

*Specialist water fixtures*

Tap fixtures used for:

- drinking, cooking or food preparation
- cleaning and facilities management, and
- laboratory uses

are excluded from WELS rating standards. These fixtures should be fit-for-purpose and consider best in class criteria instead.

*Showers*

Shower fixtures must aim to achieve minimal water consumption. As a guideline, fittings should be between 4.5-7.5L/min depending on the water system.

Time controlled fixtures may be worth exploring, provided they are appropriately used and fit-for-purpose.

*Irrigation*

Explore how irrigation for landscaping can avoid, or minimise, reliance on potable water through grey- or rain-water use, moisture sensors and efficient irrigation systems.

**External Drinking and Water Fountains**

Simple, low-maintenance, accessible drinking fountains are preferred.

If a drinking tap is away from a building, explore designs that avoid the need for stormwater connections. Ensure any free-draining design can accommodate the expected volumes of discharge without negatively impacting soft landscaping.

**Booster Pumps**

When conditions require pressure-boosting pumps

to maintain levels of service, provide variable-speed drives for flexibility in flow control.

**Hot Water**

Electrically heated hot-water systems are preferred for environmental reasons. Where this will not provide functional outcomes, explore alternatives with the Ministry for agreement.

For higher demands, explore whether centralised or stand-alone systems are most appropriate.

Centralised systems require monitoring equipment for pressure and temperature.

*Energy efficiency*

Locate hot-water systems as close as practical to fixtures to reduce energy losses.

Optimise water storage capacity based on expected average demand, avoid oversizing water storage.

*Health and Safety*

Hot-water systems must balance the competing health and safety outcomes of reducing scald risks at the same time as ensuring bacterial growth cannot occur. Hot water must be stored above 60°C to inhibit the growth of legionella bacteria, with a maximum temperature of 40°C for outlets likely.

to be used by learners for sanitary handwashing purposes. Note that 40°C is not a target. It is acceptable to have lower handwashing temperatures provided water is comfortable enough for thorough handwashing.

All other hot-water temperatures must be to expected safety standards.

*Solar heating*

Solar heating of hot water requires special consideration and must be agreed. Any base plant must be sized to provide a school's hot-water requirements without reliance on solar.

**Valves for Maintenance**

Provide sufficient valving to allow for the non-intrusive isolation of water supply to discrete areas for maintenance or service. Valves should also be provided to quickly shut off whole areas as needed.

Specify main valves to accommodate increased pressure and flow expected with future planned site expansions.

### 3.11.2 Wastewater and Trade Waste

**Wastewater**

Our preference is that schools discharge to a reticulated network wherever practicable.

**Discharge to a Reticulated Network**

Design teams must liaise early with local authorities to confirm the availability of a wastewater discharge connection and any restriction on total or peak discharge flows.

For challenging sites, consider using pressure sewer systems to limit total wastewater discharges and/or manage peak flows.

**On-site Wastewater Disposal**

If on-site disposal of wastewater is the only practicable option, the following requirements apply:

- System design must comply with Ministry standards as well as meet consenting requirements.
- Treatment systems and discharge fields or irrigation areas must be segregated from school learning and recreation spaces and clearly demarcated with planting and fencing
- Systems must be located in areas assessed to:
  - have the least impact on outdoor learning areas
  - provide suitable and sustainable long-term treatment
  - meet the requirement for reserve areas set by the controlling authority, and provide room for expansion to meet projected Masterplan roll growth. The Masterplan expansion area must be clearly identified in site plans provided to the Ministry.
- Stormwater infiltration and inflow must be excluded from the wastewater system.
- Specific atypical wastewater discharges (for example, backwash from water treatment plans) must be assessed to ensure they do not compromise the performance and sustainability

of the wastewater treatment system. Alternative disposal options must be provided if there is any concern.

Our preference is for gravity design systems. Where site constraints or advanced treatment includes pumping and filtration of treated wastewater, pumps or filters must be sized appropriately for the design load with an allowance for projected future growth.

Mechanical design must include provision for resilience through redundancy, enhanced cyclic maintenance or back-up storage.

Design sewers to maximise self-cleaning to reduce maintenance requirements, with access hatches and shafts included as necessary.

**Grey Water and Stormwater Recycling**

Natural stormwater treatment and attenuation systems, such as rain gardens, wetlands and ponds must be prioritised ahead of engineered solutions. Only where these systems may impact on usable site for learners should engineered solutions such as gross pollutant treatment devices, stormwater soakage systems and/or attenuation tanks be considered.

Stormwater capture and recycling for non-potable applications should be considered for all new buildings and greenfield sites. Grey water capture for non-potable re-use should be considered if the controlling authority has an approval pathway and there is confidence the system will be well managed.

*Trade and Chemical Waste*

Discuss trade and chemical waste requirements with schools to ensure systems are appropriately designed.

Where acidic or basic waste is being discharged from laboratories, automated dosing pumps (duty and standby) are required to neutralise the waste in a holding tank prior to discharge, with reasonable capacity above the calculated design load. These should be located securely with maintenance access, not in critical or sterile areas.

Separators to filter extraneous material from entering the system are to be included where required.

### 3.11.3 Stormwater and Flood Management

A high-level assessment of coastal flooding and regional flooding risk for the site must be completed in addition to compliance with local stormwater catchment and flood management requirements. Enquire with the Ministry on what information may be held about a school before undertaking any assessment.

**Local Stormwater Catchment Level of Service Requirements**

*Finished Floor Levels*

All buildings are to have finished floor levels (FFL) with a minimum freeboard of 300mm above the computed 1 percent annual exceedance probability (AEP, in lay terms, the 100-year flood level) or greater, when required by a controlling authority.

In areas where the probability of flooding exceeding prescribed FFLs is high, ensure the design responds appropriately to our resilience objectives by raising the floor levels to an appropriate height.

*Stormwater and Overland Flow*

Design parameters for storm volumes and peak flows are to be derived allowing for climate change and property resilience. Ensure design is in accordance with current Ministry for Environment (MfE) guidelines for climate change or uses the most up-to-date data available. Ask the Ministry for any held asset information on climate risk assessments or adaptation plans.

Primary stormwater systems are to be designed to cope with the 10 percent AEP event, without surcharging, as a minimum.

Where controlled overland secondary flow paths or ponding areas cannot be provided, the primary system is to be designed to cope with a 1 percent AEP event. Our preference is for formalized and resilient secondary flow paths to be provided.

Secondary flow paths and ponding areas are to be:

- identified and provided to cope safely with flows up to and including the 1 percent AEP event
- identified in flood management drawings
- designed to ensure peak flow depths and velocities do not compromise safe egress and exit routes.

Site levels and overland flow management must

direct water away from buildings and hardstand areas. For buildings with timber foundations, design teams should prevent overland flow being directed under the sub-floor of a building.

*Drainage*

Surface water should not unduly impact the ability for outdoor spaces to be used year-round. Maximise sustainable rainwater management practices, wherever practicable by utilising:

- pervious surfaces wherever practical to promote infiltration and reduce runoff, and/or
- soft landscape areas for stormwater detention, infiltration and treatment.

Where not possible:

- primary drainage in the region of buildings and paved areas is to be by a combination of designed interception systems, kerb and channel, and underground drains as appropriate
- primary surface drainage in soft landscape areas may be by swale drains or similar, providing that usable student areas are not unduly constrained, and any feature does not create a potential future planning constraint.

## 3.12 Security

We promote the security principles of Deter, Detect and Delay for property design. Security measures must not compromise our wider priorities and principles outlined in this document and on our security design web pages.

Design teams must consider safety and security in school hours and out of hours.

### 3.12.1 Deterring Antisocial Behaviour

**Crime Prevention through Environmental Design (CPTED)**

Design teams must maximise strategies using CPTED principles before implementing other deterrents or physical security systems.

**Passive Surveillance and Safety**

Passive surveillance is to be maximised in schools. Avoid the creation of dead ends, backs of buildings and unobservable nooks on circulation routes.

**Porous Schools**

Porous, connected, highly permeable schools are our strong preference to promote personal safety, connectivity, activation of spaces and to support CPTED principles.

**Activated Schools**

Pleasant schools that attract community are less likely to promote antisocial behaviour. Look to create spaces strongly connected to the community for out-of-hours use.

**School Boundaries**

Ensure boundary designs do not create unreasonable barriers for accessing a school.

To create effective boundaries, explore:

- landscaping solutions such as bollards, fencing, planting or surfacing treatments
- preventing unwanted vehicle access to school grounds without preventing pedestrian access.

**Roof Access**

Design must prevent unauthorised roof access.

**Designing Structures to Prevent Access**

To ensure structures do not negatively impact security, a design must:

- not provide footholds or handholds
- make structures unclimbable through being smooth, where possible.

**General Exterior Lighting**

Ensure lighting supports safety and quality circulation.

Lighting must:

- illuminate key circulation routes, including exterior doorways and parking areas
- use ‘dark sky’ light fittings, which direct light down to where it is needed rather than contribute to light pollution — lighting should not adversely affect neighbours
- be resistant to vandalism.

**Security Lighting**

Design lights to:

- use passive infrared lighting activated with a human presence
- be resistant to vandalism
- have inaccessible detector heads
- support CCTV requirements.

**Locks and Keys**

Designers must specify high-quality commercial locking systems.

Ensure:

- keys cannot be copied without authorisation
- a 'master key' system is implemented that supports simplicity of access to facilities
- consider after-hours and community access needs.

**Electronic Access Control**

Electronic access is acceptable in schools and encouraged when beneficial for managing access. Ensure electronic systems meet required codes and standards, with internal overrides and manual key overrides in the event of equipment or power failure.

Consider after-hours and community access needs.

### 3.12.2 Detect Antisocial Behaviour

**Security Systems**

Ensure security systems meet security standards outlined on our website.

The fire alarm must be the lead system when combined with a security system. The fire alarm can activate the security system but not vice versa.

**Closed-circuit Television (CCTV)**

Design teams must use providers familiar with school ICT and CCTV standards. When designing a CCTV system, suggested areas to focus on are:

- discouraging vandalism
- safety for staff and learners
- recording intruder evidence.

Ensure CCTV system design and access comply with Privacy Act requirements.

### 3.12.3 Delay

Explore where delaying an unauthorised access attempt would allow staff or security time to intervene. This approach may also be useful where it is necessary to prevent learners accessing hazardous or out of bounds areas.

## 3.13 Safety

Design teams and engineers must consider Safety in Design early and throughout the design process.

Design outcomes must promote healthy, safe school environments during, and outside of, school hours for all school users, including people working in schools.

Design to eliminate and/or minimise the requirement for:

- daily health and safety management by school staff, and
- safety 'add-ons' late in the design process.

Prioritise proactive design solutions for safety. For example:

- maximise passive oversight throughout a school rather than rely on CCTV
- use thoughtful site planning and natural landscaping features for safety
- provide level surfaces rather than fit contrasting edge strips
- avoid creating hazards that will need mitigation on or near circulation routes
- avoid the need to carry out maintenance at height.

### 3.13.1 Roof Access

**Fall Arrest Systems**

Not all roofs require fall arrest systems to be installed. Assess whether roof access is needed for regular maintenance of plant equipment or other features. Avoid installing roof access where it is not necessary for regular maintenance.

**Gutter-cleaning Access**

For gutter cleaning, our preference is cleaning via ground (or other cleaning innovations) versus roof access. Consider the comparative costs between methods, including ongoing safety system certification costs.

Our preference is to:

- design gutters for obvious overflow when failing (see section 3.3.2), and
- enable cherry-picker access and/or engage with professionals who utilise temporary anchor systems.

If fall arrest systems are required, ensure the design:

- supports weathertightness and durability requirements
- supports functional maintenance requirements

for the building or any roof plant and no more
- specifies durable anchors with long life expectancy and infrequent inspection periods.

**Single-level Buildings**

Use external ladder brackets to provide roof access points, if required.

**Two-storey Buildings**

Where roof access is required for occasional inspection of penetrations or gutter maintenance, preference is for access via machinery and the use of temporary anchor systems, if this can be done safely.

**Multi-level Buildings**

Multilevel buildings with plant on the roof require safe roof access from within the building.

Ensure roof access is designed to:

- support maintenance requirements
- reduce the level of safety measures required by maintenance workers
- eliminate the risk of foot traffic damaging the roof.

# Appendix: Glossary

| Term | Definition |
|---|---|
| **Active recreaction space** | Spaces where learners can undertake active play, sporting and physical recreation activities. |
| **Ākonga** | Students or learners. |
| **Amenity** | A desirable or useful feature or facility that increases the comfort, usability or enjoyment of a space. |
| **Ancillary fire egress route** | Fire egress routes that are additional to accessible primary or secondary circulation routes, they are included to achieve fire egress safety requirements and are not considered part of a school's general circulation. |
| **Ātea** | An open area in front of a wharenui where formal welcomes to visitors take place and issues are debated. |
| **Building enclosure** | The exterior enclosure of a building that separates the external environment from the internal environment. It is comprised of the roof, wall system, windows and doors of a building. The enclosure's role is to control air, water, light, thermal performance, fire, and noise. |
| **Building footprint** | The amount of space that a building occupies on a site. |
| **Bulk and location** | In the context of schools, a bulk and location plan is a complete long-term site plan showing the size and location of buildings, infrastructure and outdoors spaces on a school site, but typically involves less investigations into condition and infrastructure. |
| **Circulation bottleneck** | A localised disruption to circulation of people typically due to a narrowing constriction or an obstruction. For example, a bend in a path, a doorway, a traffic hazard, or an obstacle can cause a circulation bottleneck. |
| **Constrained site** | A school site that is considered to have a limited amount of useable outdoor area per learner. |
| **CPTED** | Crime Prevention Through Environmental Design is a crime prevention philosophy whereby effective design of the built environment is used to encourage activity and increase passive surveillance. CPTED aims to increase the sense of being seen or watched. |

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| **DQLS** | Designing Quality Learning Spaces. The Ministry's series of technical guidance that outlines the requirements for the main internal environmental quality factors: acoustics, lighting and visual comfort, indoor air quality and thermal comfort. These technical guidance documents are part of a suite of School Property Design Standard documents. |
| **DSNZ** | Designing Schools in Aotearoa New Zealand. The Ministry's principal document in a suite of School Property Design Standards and guideline documents. |
| **Fale** | A pasifika styled small building with open sides and a roof. |
| **Flexible learning space** | A learning space that can be configured and used in different ways to support and enable a range of teaching and learning approaches. They should be adaptable to respond to a range of educational practices. Flexible learning spaces make up the physical environment subset of innovative learning environments . |
| **General learning space** | Regular teaching spaces like classrooms, breakout spaces, learning corridors. |
| **Grain** | The common orientation or pattern of buildings on a site and the spaces between them. |
| **Gross floor area (GFA)** | The area enclosed by all the exterior walls of a building, measured to the external face of the external walls. |
| **Highly constrained site** | A school site that is considered to have a limited amount of useable outdoor area per learner and should therefore consider strategies for increasing indoor and outdoor space amenity. |
| **Innovative learning environment** | A term used in New Zealand and internationally to refer to the wider ecosystem of a learning environment including people (social), practice (pedagogical) and physical environment (flexible learning space). |
| **Kaitiakitanga** | Guardianship or protection related to people, communities, cultures and the environment. |
| **Learning support** | Extra support for students who have higher needs for learning. This might be because of disability, learning difficulties, disadvantage, physical, mental health, or behaviour. |
| **Long-term property plan** | An all-encompassing term used to describe various methods of planning to ensure quality long-term outcomes for the school's property and site. |
| **Mana whenua** | Māori groups with customary rights to manage identified areas of land. |
| **Manaakitanga** | Fundamental to all relationships, it is the expression of kindness, empathy and care extended to guests, whānau and communities in a way that respects and enhances their mana. |

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| **Masterplan** | One of multiple types of property planning used to ensure long-term quality outcomes for the school site. Masterplans are a more detailed and holistic site-wide plan that considers the size, positioning and form of buildings, infrastructure and outdoor spaces. Masterplans will generally involve more thorough investigations and analysis. |
| **Net floor area** | The occupiable/useable area within buildings such as teaching spaces, resource rooms, administration spaces, gyms, libraries, auditoriums, halls and multi-purpose spaces. |
| **Neurodiverse learner** | A learner with a variability in how their brains engage in learning, perceive information and organise and communicate information. |
| **NZS 4121** | New Zealand Standard 4121:2001 Design for access and mobility: buildings and associated facilities. |
| **Operational carbon** | Emissions directly and indirectly attributed to the operation of buildings. This includes the use of energy (for heating, cooling, hot water, lighting, ventilation, and appliances etc.) and water. |
| **Passive recreation space** | Spaces where learners socialise, relax, play informally and eat. Often these spaces are appropriate for outdoor learning. |
| **Placemaking** | A people-centred, collaborative approach to the planning and design of a space that helps to build peoples connection to their places. |
| **Primary circulation route** | The primary circulation routes likely to be highly utilised throughout a day by learners or staff. |
| **Quality learning environment** | Quality Learning Environments refer to the fitness of purpose of the physical environmental attributes of a space (acoustic, lighting, thermal comfort and indoor air quality), an asset's condition, and it's operational efficiency. |
| **Safety in Design** | Safety in Design is a process that integrates hazard identification and risk assessment methods early and throughout the design process. |
| **Satellite school** | A satellite classroom, or number of classrooms, of a specialist school (base school) that operates from a host school. |
| **School Property Guide (SPG)** | The SPG is a calculator that determines how much area, in square metres, a school may need for teaching and non-teaching uses. Area is related to a school's student roll. |
| **School property plan** | A school's planning tool for the growth, upgrade and maintenance of their school property. |
| **Secondary circulation route** | Secondary circulation routes are either: low utilisation throughout a day, or low volume, medium utilisation. |
| **Service route** | Not a circulation route required for volume movement between learning or administration spaces, but is required for access to amenity, utility spaces or service areas. |

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| **Sightlines / passive oversight** | An unobstructed view from one place to another. This is particularly important where passive surveillance is required or where teachers need to be able to watch over students. |
| **Specialist learning space** | Rooms where specialist teaching of a practical nature occur such as technology, science laboratories, and performing arts spaces. |
| **Specialist School** | A day specialist school, residential specialist school or regional health school for students with specialist education needs. This term replaces the term special needs school. |
| **Tangata whenua** | The people of the land; the local people of that area. |
| **Taonga** | Anything considered to be of value including, objects, resources, people, phenomenon, ideas and techniques. |
| **Te ao Māori** | The Māori world view, which acknowledges the connectedness between living and non-living things. |
| **Teaching space** | Any space that is used for teaching or learning purposes. A term that is interchangeable with classroom, but better covers the variation of spaces seen in schools. |
| **Tīkanga** | A custom, practice or traditional value. Tikanga may differ from iwi to iwi. |
| **Total building envelope (SPG)** | Total building envelope refers to the total SPG area (m2) entitlement for a school. The total building envelope is generally the maximum property area (m2) that a school can be provided. |
| **Traffic management plan** | A plan to manage foot and vehicular traffic safely and efficiently. This could include how traffic moves in and around a school, where vehicles can park and how pedestrians are kept safe. |
| **Unconstrained site** | A school site that is not considered to have a limited amount of useable outdoor area per learner. |
| **Universal bathroom** | A specialised bathroom designed for use by students with a diverse range of physical needs. Users may be independent or require others to support them. |
| **Universal design** | An approach to design that follows the principles that; everyone should be included, everywhere should be physically accessible, everything should be equally accessible and every solution should seek to accommodate the needs of building users. |
| **Usable outdoor space** | Any covered or uncovered outdoor area which is safe and suitable for students to actively or passively play and occupy. For example, this excludes carparks, childcare centres, roads, driveways, out-of-bounds area, dense bush and land that is too steep to occupy safely. |
| **Waharoa** | A gateway, or main entry for visitors to a site. Often defined by a structure that symbolises the gateway to entering a site. |

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| **Wairuatanga** | The holistic wellbeing of people that acknowledges a spiritual connectedness to people as a collective and the environment. |
| **Whānau** | Family. |
| **Whanaungatanga** | Relationship, kinship, sense of family connection – a relationship through shared experiences and working together which provides people with a sense of belonging. |
| **Whare wānanga** | A place where learning occurs, often the term is related to higher education but can be a term used for whare-style buildings within schools. |
| **Whole-of-life embodied carbon** | Emissions associated with the use of materials in a building, as well as the construction processes throughout the whole lifecycle of the building (eg. Initial construction, maintenance, renovation, and demolition). It includes the embodied carbon of construction materials, and emissions from activities such as transportation, construction, and waste disposal. |

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