Developing Playgrounds in Early Childhood Environments

Early Childhood Development and Hutt Valley District Health Board
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Aesthetics and design

The aim of a quality playground is to provide children with a wide range of diverse and enriching experiences in a safe, pleasant and well-supervised environment.

The environment needs to be carefully planned with design considerations given to the following:

- Size of site
- Shape of site
- Scale of equipment
- Supervision
- Utilisation of existing natural features
- Planting
- Areas of play - active, quiet, open
- Flow between areas
- Building materials
- Equipment – mobile and fixed
- Drainage
- Sun and shade

Because playground development can be expensive it is advisable that advice from professionals - such as landscape architects, and early childhood professional development advisers, is sought during the planning process.

These professionals have information, and knowledge of successful designs and aesthetics, which can contribute to a quality playground development. Too often expensive and ugly mistakes are made in playground developments because of incorrect information and bad design principles.

Planning and developing a quality playground requires consultation, discussion and observation by all those involved in the project.

There are many books and publications available which also describe aspects of playground development. These highlight good design principles and often have pictures of successful equipment ideas. It is advisable to read as widely as possible about playground development and also to visit successful playground sites in your community.

It is important for adults to keep in mind that the playground must meet children’s needs for active exploration and physical exertion rather than adult needs for tidiness or perfection.
Site drainage

Regulations

Drainage arrangements must comply with Section (e) 2 of the Building Code which states that no water may flow from the playground site over the boundary and on to a neighbouring property.

Contact your local council for further advice and information.

Points to consider

- What type of safety surface will be used and how will this affect drainage and run off?

- Is the section sloping or is the surface water likely to flow over the boundary?

- Does water currently pool in specific areas after rain?

- What type of soil is there on site i.e. clay or sandy?

- Could plants be incorporated to assist with drainage?

- Where are you planning to empty your water trough?

Some troughs have hose attachments underneath so water can be easily drained to a suitable area.

Sandpits require good drainage. (See section on sandpit construction for further information).

Some safety surface manufactures will provide advice on drainage specific to their product. They may also arrange drainage work as part of their contract to install safety surfacing.
Fences

Quote from Education (Early Childhood Centres) Regulations 1998–

• 24. (l) Outside doors fences and gates are secure and safe enough to ensure children are not able to leave a centre without knowledge of the staff.

Recommended fence height:

Although 1.2 metres is a good fence height, the recommended minimum height is 1.5 metres.

Note: Regardless of fence height children need to be kept within the centre. Be aware of any boxes next to a fence or railings running horizontally, which may enable a child to climb the fence. Also avoid holes greater than 25mm which allow children to get a toehold or foothold to climb.

Avoid

• Large gauge wire mesh with holes larger than 25mm.
• Horizontal palings.
• Trees and equipment next to fences that enable climbing of fence.

Things to consider:

• Do you want children to be able to see out of the playground?
• Do you need protection from the wind?

Resource options:

• Solid wood.
• Solid wood with windows or peepholes.
• Swimming pool fencing.
• Perspex.
• Small gauge wire mesh.

Barrier fence on top of climbing structure.

Internal wooden fence with driftwood palings.
Safety surfaces

Climbing equipment of any height should be on grass or safety surface. The regulations require compliance to all relevant New Zealand safety standards.

**Equipment over 500 mm needs to be on loose fill or synthetic safety surface with a clearance of 1.9 metres fall space around the equipment.**

The recommended maximum height of climbing equipment for children under 5 is **1.5 metres**.

Loose fill surface (most common are bark chips and pea gravel)

- Lower cost but requires high maintenance because it needs turning to remain effective.
- Loose fill needs checking for animal faeces, glass and buried objects, e.g. nails.

- Loose fill sites need good drainage and low retaining walls to keep the fill confined.
- Loose fill needs to be separated from the soil beneath with a semi-permeable material e.g. weed matting.
- Toddlers often find negotiating loose fill surfaces much more difficult than synthetic surfaces or grass.

CAUTION: pea gravel is not a suitable safety surface for infants and toddlers.

**Depth of loose fill**

**250 – 300mm.**

**Bark chips**

- Last a maximum of 2 years but this depends on the quality of the bark chips. Grade 4 (25-50 mm size) is less likely to break down as quickly.
- Bark chips should not contain fine material or splinters.

**Pea gravel**

- Needs raking and may need regular sweeping back into the loose fill area.
- Pea gravel can cause a hazard if it spills over on to other surfaces and children slip on it.

**Synthetic safety surfaces**

There are a variety of options available. For example:

- Poured synthetic surfaces.
- Multi-layered tile surfaces that allow grass to grow through the tiles.
- Solid synthetic tiles.
A synthetic poured surface:

- Gives greater flexibility for the initial design but is fixed once it is poured.

- Is flexible for difficult uneven sites and easy for children to negotiate in bare feet and on bikes.

- Synthetic surfacing is more expensive than loose fill but has lower on-going maintenance costs.

Hard Surfaces

Hard surfaces, such as concrete and grass, are not appropriate as safety surfaces but are important to include in playgrounds. Wheeled activities, ball games etc. require hard surfaces. (Refer section: Paths).

Synthetic tiles:

- Three layered tiles, which do allow for grass to grow through, can contribute to a more ‘natural’ look in the playground.

- Single layered tile surfaces may have fall height ratings less than 1.5 metres.

- Check with the safety surface manufacturer about fall heights and ask for a written performance guarantee.
Early childhood regulation 24 (q) states:

*There are systems in place that prevent children from gaining access to any plant matter that is or is capable of being poisonous to children.*

**Poisonous plants**

Check the poisonous plants list available from the Ministry of Health, City Councils or Early Childhood Development. However it should be noted that because many plants are poisonous if eaten, a balance should be struck between children’s learning experiences and safety. For example swan plants, although poisonous, offer fabulous learning opportunities for children. It is advisable to keep these plants fenced off from the children.

This may involve a combination of avoiding plants with attractive poisonous berries and ensuring adequate supervision and education of children. The leaves of a Camellia, for example, are poisonous if eaten. Children need awareness and education rather than the total eradication of attractive plants!

**Avoid**

- Plants with poisonous berries.
- Plants that cause asthma, e.g. privet, Christmas lilies, pine trees.
- Plants with thorns or spikes, which are low to the ground or, in high use areas.
- Plants that attract lots of bees.

**Things to Consider:**

A well-planted playground offers children the experience of a natural environment - something that is becoming increasingly unavailable in communities today.

Plants can offer children shade, interesting textures and smells, encourage discussion of science concepts, attract birds, and provide flowers for the table.

**Native Plants:**

Native plants tend to be extremely hardy and require little maintenance. There is a huge range of native plants appropriate for early childhood environments. Native trees provide continuous shade all year round.

**Deciduous trees:**

Allow shade in summer and light in winter. However the leaves will fall so consider their position carefully.
Shade

Shade is becoming an increasingly important consideration in the planning of playgrounds. New Zealand has one of the highest rates of skin cancer in the world. Early childhood centres can play a big part in reducing this risk by providing good shade in playgrounds.

**Things to consider**

- Sun angles differ during the year so shade requirements may change seasonally.

- Optimise existing shade e.g. place sandpits under trees.

Dense shrubberies can provide good shaded play nooks for children.

Each play area has its own shade requirements e.g. some areas need more shade than others.

For example sandpits may require permanent shade fixtures, because they are used for longer periods of time.

- Observe where the shade cloth needs positioning so the required play area is actually covered. This may mean extending the shade cloth beyond the perimeter of the specified play area.

Seasonal conditions may determine shade options e.g. retractable shades for allowing light in winter, deciduous trees, trellis with vines growing on them, etc.

- Some ground surfaces reflect less ultraviolet rays than others e.g. pavers and grass reflect less than flat concrete.

NOTE: rough surfaces break up ultraviolet rays.

Ensure the playground is planted with big trees. Temporary fixed structures can be put in place until trees mature.

Burn time in autumn and spring is 24 minutes. In summer this is 12 minutes.
Climbing equipment

The Statement of Desirable Objectives and Practices (DOPs) states:

*Educators should plan, implement and evaluate curriculum for children, in which children gain confidence in and control of their bodies; children learn strategies for active exploration.*

**Safety standards**

- Anything over **0.5 metres** needs to be surrounded by **1.9 metres** of safety surfacing.
- No climbing equipment of any height should be situated on concrete.

**Things to consider**

- When there is limited space in an outside environment it is important to consider how moveable and fixed equipment can be combined to provide an optimum range of physical challenges and activities for a **wide age range** of children.
- Avoid placing large equipment too close together. There should be enough space (ideally 1.9m) to prevent a child from impacting on other equipment during a fall.
- Fixed equipment such as climbing frames and swings require a considerable amount of safety surfacing to make them compliant with safety standards.
- Fixed equipment can limit children’s imaginative play, cooperation and problem solving.

**Moveable equipment over 0.5 metres**

A large area of safety surfacing should be provided to enable the children to move equipment independently so they can gain the **benefits of** cooperative play, child-directed imaginative play, and problem solving.

**Platforms on forts:**

Where height differences in platforms on forts exceed **0.5 metres** then the levels need either to be fenced or the lower level safety surfaced.

**Positioning of fixed equipment:**

Careful positioning of fixed equipment is important so that space for alternative activities is easily accessible.
Head Entrapment

- Gaps larger than 110 mm and less than 230 mm present the risk of head entrapment. These gaps can sometimes be found between fence palings, steps, rungs on ladders and in cargo nets.
  - Gaps between fence palings should be 100 mm or less.
  - Gaps on cargo nets should be less than 110 mm.

Height of structures/platforms

- The ACC recommend that falls in early childhood centres should not exceed 1.5 metres.

Height of barriers on fixed platforms:

- Barriers on platforms should be 1 metre.

Height of barriers on moveable equipment

- Any moveable platform must have barriers if it is over 1.2 metres.

Things to consider

- Perspex can provide an unclimbable surface which can assist with the supervision of children. It also maximises communication opportunities between children on the platform and those lower down, reducing the temptation to climb up to communicate.

Ensure

- All bolts are recessed.
- Wood is in good condition – not splintered.
- Chains are checked to ensure that fingers cannot be trapped in the links.

Advantages of moveable equipment:

- Versatile.
- Challenging.
- Creative.
- Children can make choices and direct their own play.
- Relatively inexpensive but needs replacing regularly.

Steps

- Standard 300 mm steps are often not suitable for younger children. Steps 100 mm high x 350 mm deep are best for crawling babies. Low, deep steps are the safest option.
Decking and ramps

The playground area should be designed to include all children, and should not exclude those with physical disabilities and young children unable to negotiate stairs.

Ramps

- Should not exceed a slope of 1 in 12.
- Ramps best suited for wheelchairs have slopes of 6% or 1 in 16.5.
- The Building Act has more detailed information regarding ramps, handrails, etc.

Decks:

- Decks can improve indoor/ outdoor flow.
- They provide a dry surface for the winter and can often be easily enclosed.
- Decks over 0.5 metres must have a barrier or safety surfacing below them.
- Decks can be a barrier to supervision and may also cause congestion if there is inadequate egress.

Things to consider:

- Shallow, wide steps off decks can double as seating and allow easy access. Very wide steps will improve supervision by reducing the need for fencing.
- Steps should be in addition to the provision of a ramp.
- Decks can offer a good platform for slides or other climbing apparatus. However you should consider how the flow of traffic will affect the use of the deck and its access.
Paths should not have slopes greater than 5% or 1 in 20. Slopes of 3 – 4% are ideal for prams, wheelchairs or buggies.

A paved pathway should be at least 900 mm wide to allow access to wheelchairs.

Avoid very rough surfaces such as gravel, which will limit wheelchair access and flow for bikes and trolleys.

Consider interesting surfaces for paths. Inlays of small stones, coloured glass, shells or a variety of tiles can add sensory and aesthetic interest.

Paths should be level with the lawn beside it. Do not build a path above ground surface as this increases the likelihood of children tripping and falling.
Mounds can provide excellent climbing opportunities without necessarily requiring safety surfacing, fencing for platforms etc.

The following issues need consideration

- Because children are able to roll down a mound, the circulation space around the base should be considered in a similar light to slides.

- At least 2 metres of clear space around the bottom of the mound needs to be maintained.

- This circulation space should provide soft fall - which may include grass or other recognised safety surfaces.

Mounds may also provide a safe base for slides

If the slide sits flush on the mound, a safety surface is only required on the slide ‘run off’.

- Steps, ramps and other climbing challenges may be incorporated into a mound.

- Consideration needs to be given to the age range of the children using the area.

- Wide, shallow steps are safest for all age groups. 350 mm deep x 100 mm high is very safe for toddlers.
Sandpits are considered a basic play provision in an early childhood environment.

The recommended size of a sandpit for an early childhood centre **licensed for up to ten children** is: **12-15 square metres.**

However because sandpits are extremely popular and well used it is advisable to make the sandpit as big as possible.

The early childhood regulations state that:

**All sandpits, bark pits, and similar facilities are covered after the last session each day, or, if covering is impracticable, are raked, before the first session each day and inspected for animal droppings and dangerous objects.**

**Planting**

Plants that are suitable for coastal areas will grow well near the sandpit area eg native grasses, daisies and flaxes.

**Water**

Consider having a tap, or water source, close by so children can combine water and sand play.

**Constructing a sand pit (see appendix 1)**

- Dig sandpit area up to **600mm** deep.
- Edge sides - tanalised posts, marine ply, bricks or blocks.
- Build edge up to **200 mm** above ground - total depth of pit is now 800 mm.
- Line bottom with **150-300 mm** scoria or gravel and cover with shade cloth so children cannot dig up scoria.
- Add **500 mm** sand - fine grain sand is recommended.

**Drainage**

Field or strip drains may be necessary for adequate drainage. It may be important to consult a plumber.

**Think about**

Seating, access for infants and toddlers, trolleys, shade, storage of sandpit toys and equipment, children’s transition from sandpit to other areas.

**Cleaning a sandpit**

The most effective cleanser for a sandpit is water and sun.
**Swings**

**Safety issues**

The main safety issues to consider with swings in supervised early childhood centres are:

- The trajectory and swing arc of the swing.
- The proximity of other equipment and structures to swings.
- Traffic flow around swings.

**Finger entrapment**

Threading nylon cord through the swing’s chains, or covering the chain with plastic tubing, can prevent finger entrapment.

**Determining swing arc**

For most swings the length of the chain or rope that holds the swing equals the swing arc.

For some swing structures e.g. barrels, the real swing arc may be less and is determined by actually swinging the swing out as far as a child can take it.

**Design standards based on current regulations**

- **Gap between frame and swings - 400mm.**
- **Gap between swings – 600mm.**
- **Height of seat from ground surface**
  - Between 455mm and 635mm (485mm for cradle seats).

**Swings need approximately 7m2 per swing:**

1. **Safety surface needed from the swing frame**

   A safe fall surface from each end of the swing frame’s central position to encompass the swing arc. The distance is determined by the height of the swing and ropes (see diagram).

2. **Safety surface beyond the swing arc**

   1.9 metres beyond each end of the swing arc of safe fall surfacing. This is in addition to the swing arc area.

3. **Circulation space**

   Where possible, a space of 2 metres clearance between the operating area of the swing and other equipment, paths, fences, or other obstacles, is advised to create a ‘no-go’ safe area.
SWINGS

DIAGRAM 1: PLAN (based on current regulations)
Arc of swing = Height of swing & ropes

DIAGRAM 2
Acknowledgements

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