

HOW SAFE is YOUR LOCAL PLAYGROUND?

by Michael Kearnes

Standards Australia released AS/NZS 4422:1996 Playground Surfacing—Specifications, Requirement and Test Method in 1996. This standard was published more than 10 years ago. This article reviews how Local Government Authorities (LGAs) have adopted, implemented and enforced the requirements contained within this important Standard.

Introduction

It's hard to believe, but prior to 1996 and AS/NZS 4422's introduction, there were no Australian Standards or any other requirements for a safety surface to be installed or certified for playground equipment. There were also no requirements for a safe fall zone from the perimeter of the equipment, the desired thicknesses of loose fill materials or unity systems, and more importantly, no accredited requirements or specifications for the certification of any safety surface material used in Australia.

Commonly referred to as 'Softfall Material,' 'Impact Attenuating Surface' or 'Undersurfacing Material,' the various types of safety surface materials available and used in a range of playgrounds or early learning centre sites typically are either or a combination of pine barks, sand, woodchips, and mulch which are referred to as a 'Loose Fill System,' whilst 'Unity Systems' are either artificial grass, wetpour rubber or rubber tile systems, to name a few.

The most important requirement of this standard was the introduction of a detailed testing and certification criteria to determine and certify any type of safety surface material and its impact attenuation capabilities.

Many other regulations were also introduced such as the required level of loose fill systems, fall zone recommendations and clearances, the height that an impact attenuating surface is required and a range of many other important requirements and specifications.

Almost all local councils (LGAs) generally installed all their playground equipment items such as swings, large metal slides, wooden plank seesaws, monkey bars, merry-go-rounds, modular play equipment units and other such play activities directly on grass or dirt.

Some LGAs even installed equipment directly on an asphalt or concrete surface.

Due to the high usage by children playing on the equipment, erosion and wear zones in the soil and grass were created. To reduce these wear areas created by usage, many LGAs simply installed concrete slabs at all entry and exit areas of the equipment, particularly under slides, steps and swings.

As safety surface material was not a regulation or requirement prior to 1996, many LGAs simply didn't install it.

LGAs that did install or provide a token safety surface material, generally had clearances from the play equipment to the playground border of between 1 metre and 1.5 metres. Border materials mainly consisted of treated logs or sleepers and generally, loose fill materials of pinebark or woodchip were installed with thicknesses of around 100mm in depth.

Standard introduced

Standards Australia released AS/NZS 4422 in 1996 to provide the industry with a minimum baseline requirement with specifications and guidelines to reduce the significantly high level of injuries occurring on playground equipment due to inadequate impact attenuating surfaces under and around the equipment.

The underlying influence in enforcing safety surface materials was to at all times protect the users, who were predominantly children, from possible brain injury. There was more than enough research from overseas that established and confirmed that the brain could be permanently injured through a sudden impact. This effect could be measured and calculated, hence the introduction of the Head Injury Criteria or HIC and 'g' max levels.

The introduction of a safety surface material installed that was compliant to AS/NZS 4422: 1996 would also reduce the severity of an injury in a fall by allowing the impact to propagate through the material and dissipate the impact, therefore reducing possible injury to the user and their brain.

Whilst the committee had at this time no accurate way of determining long bone fractures it felt that whilst a broken bone however was painful, the user would generally recover, but should there be an injury to the brain there could be permanent damaged, and therefore unacceptable.

A person may fall from a great height and suffer no injury whilst someone may trip and fall and suffer a fracture.

Australian Standard AS/NZS 4422:1996 finally settled the confusion within the industry on how thick (deep) loose fill materials were required to be, such as sand, woodchip or pinebark, etc by requiring a minimum thickness of 200 mm and a further 20% added for heavy traffic areas, such as slides, steps and swings.

Australian Standard AS/NZS 4422:1996 also set requirements that any equipment having a fall height

greater than 500 mm required a certified safety surface material, regardless of being either a loose fill or unitary surfacing system.

The Playground Standards also acknowledged that a user may fall from a piece of equipment but could also be pushed from the equipment and introduced a recommended fall zone from the perimeter of the equipment to the playground edging, commonly referred to as the border. A safe fall zone clearance was recommended of either 1.9m for early childhood settings or 2.5m for general public sites.

The Australian Standard AS/NZS 4422:1996 requires all safety surface material be tested and certified. This standard incorporates the HIC calculation that is limited to a 1000 HIC and the maximum impact force or gmax to 200g.

Other items were also addressed such as trip points, inhalation hazards, toxicity hazards and other general requirements.

Despite the introduction of the standard, many of the playground manufacturers and LGAs were slow to adopt the requirements of the Australian Standards AS/NZS 4422:1996 as it meant that a significant portion of the LGAs budget would need to be allocated towards the installation of a certified safety surface material and that all and any of the councils existing play sites would also require the installation of a safety surface material.

There are many children's playgrounds that do not have any form of safety surface material under the playground equipment nor has there any effort by council to address this problem.

So, as a result of the Australian Standard AS/NZS 4422:1996 introduction way back in 1996, have local councils been proactive in providing safe and compliant play sites throughout the last 10 years?

Survey results

Data was collected on a total of 2500 sites cross-sectioned from all council play sites inspected over a 10 years period between 1996 and 2006. The data was collated and grouped into four categories (see below) at five year intervals, namely: 1996, 2001 and 2006 years to highlight trending with respect to time. We have specifically made no reference to any particular LGA.

1. No impact attenuation safety surface material evident. These sites do not have any impact attenuating safety surface material under or around the playground equipment with the play equipment installed directly on dirt, natural grass, concrete or asphalt surfaces.
2. Insufficient loose fill material depth. All sites that had loose fill materials which were recorded at less than a minimum of 250 mm in depth.
3. Incorrect fall zone/safety clearance. For sites that did not provide the recommended fall zone safety

clearances of 2.5 metres from the perimeter of the play item to the playground border edging.

4. Safety surfaces and clearances that complied with AS/NZS 4422:1996

These sites meet all the requirements to Australian Standard AS/NZS 4422:1996 in both safety surface materials, loose fill levels and or fall zone clearances.

No safety surface material was tested on site with a portable test rig to determine compliance to the Australian Standards requirements of AS/NZS4422:1996. The criteria for both loose fill and unity systems were tested as follows to determine compliance at item four of this survey

All sites that contained a loose fill system of either woodchip, sand, pinebark or similar were separately tested in six areas throughout the play site. The loose fill material was removed to expose the sub base layer. The loose fill material was measured for its thickness and depth, and the mean average of the materials thicknesses applied to determine the overall loose fill material thickness of the system to the playground inspected.

All unity systems were deemed to comply with Australian Standards AS/NZS4422:1996 provided council produced a certificate of compliance from the supplier or installation company. For all other sites inspected that did not have a certificate of compliance able to be produced by council, these sites were determined as non compliant to Australian Standards AS/NZS4422:1996.

Results

The graph represents the percentages obtained for the year periods of 1996, 2001 and 2006.

Figure 1: Almost 70% of all sites inspected in 1996 provided no safety surface material (impact attenuating surface) whilst less than 10% of sites provided full compliance to Australian Standard AS/NZS 4422:1996.

Of those sites that did have a loose fill material present, approximately 23% of all sites had an insufficient level of safety surface material and 23% all had inadequate safety clearances to the playground border of 2.5m.

In 2001, five years later, the sites that do not have any safety surface material have reduced to levels of approximately 45%, whilst sites that provided compliant levels have increased to almost 20%.

The levels of inadequate safety clearances have increased to almost 27% with insufficient amounts of loose fill material at almost 40%.

In 2006, 10 years after the introduction of AS/NZS 4422:1996 and now around 23% of all sites inspected still had no safety surface material present. The level of compliance was approximately at 42%.

The levels of inadequate safety clearances has increased slightly to 30% with insufficient levels of loose fill material at 35%.

Conclusions

Whilst it is clear the amount of playground recorded with no safety surface material present have fallen significantly over the last decade, it is still disappointing that almost 23% of playgrounds, which represents a staggering 575 sites recorded in 2006, did not have any form of safety surface material present.

Sadly, the levels of a compliant safety surface material - whether it is a unity type system or loose fill material - is only approximately 42% (1050 playgrounds).

It is also disappointing that almost 35%, or 875 of all playgrounds comprising of loose fill materials used as a safety surface material are maintained at levels that are non compliant with Australian Standards AS/NZS 4422:1996 and its requirements.

And it is surprising that the amount of sites that have an inadequate safety clearance from the equipment to the playground border is still around 30% (750 playgrounds).

To be fair, it is important to inform the reader that despite the poor results exhibited by this survey there have also been a large number of LGAs that have earned a gold star and should be applauded for their efforts in providing safe and compliant play sites within their council area. It is disappointing that the LGAs that have not been proactive in their duty of care overshadow the good works that have been performed throughout the years by various other councils.

All LGAs have a high duty of care in ensuring that their local area is not a haven for potential liability. Most times after performing a detailed comprehensive audit we find that routine maintenance, regular inspections and under funded budget allocations are the three main reasons for the poor state of councils play sites, combined with inadequate upgrade and replacement forecasts creating grossly under funded programs.

Playgrounds are an asset and provide the community with an area for recreation, relaxation, learning and fun. These assets require regular maintenance and inspections with councils ensuring that all play sites are maintained and kept as safe as possible. Needless to say, upgrading

the equipment at the end of its lifespan, refurbishment and new development all cost money. If you don't have the right information it is not possible to make the right decision.

Sadly there are still some LGAs that still do not have an approved or certified Safety Management System that is compliant to Australian Standard AS/NZS 4486:1:1997. LGAs have to adopt a change in attitudes to ensure proper duty of care, not leaving unsafe and outdated equipment (that has the potential for imminent injury) able to be played on in a effort to pacify their local constituents because they don't have the funds to replace items or make them safe.

Providing safe and compliant play sites is achievable; employing or consulting qualified professionals is essential, particularly those with the expertise in providing asset management information, detailed reports and site conditions, maintenance/lifespan replacement and capital work forecasts, routine/operational and comprehensive policies and systems with a safety management system that is compliant to AS/NZS 4486 series standard.

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Kico Australia have been providing councils, schools, early learning centers and commercial customers with a wide range of asset management systems and databases, testing and certification of safety surface materials and playground equipment safety audits and equipment testing for over 15 years.

References

- 1: AS4685:2004 Australian Standard Playground Equipment Parts 1-6
- 2: AS/NZS 4422 Australian/New Zealand Standard Playground Surfacing – Specifications, Requirements and Test Methods
- 3: AS/NZS 4486: 1 1997 Australian/New Zealand Standard Playgrounds and Playground Equipment Part 1: Development, Installation, Maintenance and Operation.

