



The Need to Improve Our Oversight of These Spaces

Playground Area Standards Update

Text and images by Kenneth S. Kutska



OPPOSITE A missing bolt on this playground suspension bridge between two elevated platforms can result in complete failure of the component.

ABOVE Ken lifts one of many loose safety surfacing rubber tiles that were once glued to the concrete deck of this rooftop playground. High temperatures plus excessive moisture conditions caused by poor drainage will accelerate the breakdown of the tiles and the glues. Loose or missing tiles can cause trip and falls quite possibly to the concrete surface.

A public play area's life and the joy it brings to the children who visit it should begin with a planning meeting with the people for whom it is intended. The planning process continues as the owner works with local play equipment sales representatives to discuss specific play area needs of the project. This results in developing procurement documents for the playground equipment and the necessary compliant impact attenuating surfacing system. This process can be overwhelming for the uninformed, as the industry and its product options have changed dramatically over the years. Current economic conditions, global competition for market share of the industry and different international standards for all aspects of play area design are adding many new challenges and opportunities to the typical governmental agency's purchasing process. We all desire the perfect play area that contains something new and unique and that meets everyone's expectations. We challenge our sales representatives to come up with new and creative designs with equipment and safety surfacing systems of the highest quality that comply with safety standards and local building codes, while keeping within our shrinking budgets. Many Requests for Proposals require all qualified bids (tenders) to address items such as: play value, site amenities, installation challenges, materials' durability issues for the project's local environment and diversified levels of challenge for activities which address ease of

access for people of all abilities. This process is more of an art form than an exact science.

My observations over the past ten years and from many trips to Singapore demonstrate that the parks authority understands these concepts. I have witnessed the constant improvement in the hundreds of play areas managed by the National Parks Board and local housing authorities. These amenities appear to be very new and well maintained from a brief drive-by review. The objective is to keep these areas in good repair and properly functioning. This should be our first green objective. Maximising the life expectancy of the area is the best use of resources and minimised consumption of raw materials used in the manufacturing process of the play equipment. I will comment on my closer observations of these areas later in this article since a drive-by inspection cannot possibly do justice to the owner's responsibility for the safety of the public. First, I want to share some of the issues in bringing about changes within the children's play area industry. It can be difficult for one to keep current with the necessary changes occurring within the government regulatory agencies, whose actions impact the play equipment and safety surfacing industry. So how do we stay current?

Staying Current with Industry "Best Practices" is Imperative

Becoming a Certified Playground Safety Inspec-

tor (CPSI) through a partnership between the National Park and Recreation Association (NRPA), the International Playground Safety Institute, LLC (IPSI), and the Centre for Urban Greenery and Ecology (CUGE) is a step in the right direction. For the past 20 plus years, more than 45,000 people worldwide have attended a CPSI Course and many have attained certification status. The current network of approximately 8,000 CPSI's in-good-standing have been exposed to the many organisations that will help them stay current with the rapidly changing children's play industry. They have subscribed to *Playground Magazine* (www.playgroundmag.com) and their online magazine and newsletter. They frequently check websites to look for the latest industry developments in the National Park and Recreation Association (www.nrpa.org), the International Playground Safety Institute, LLC (www.internationalplaygroundsafetyinstitute.com), the United States Consumer Product Safety Commission's (CPSC) (www.cpsc.gov) and the International Playground Equipment Manufacturers Association (www.ipema.org). Some have even joined the American Society for Testing Materials International (ASTM) (www.astm.org) and thereby get prompted electronically to visit the website and participate in the standards development by voting on the many play industry related standard proposals that impact us all.

The following are some of the most current developments and issues facing our industry.

New Standards and Guidelines Impacting the Play Area Industry

In November 2010, the US CPSC came out with another revision to their 2008 draft Handbook for Public Playgrounds, Publication Number 325. This revision is a major step in harmonising the ASTM F1487 Standard Performance Requirements for Play Equipment for Public Use. This standard is developed through the activities of ASTM Subcommittee F15.29. For interested readers, ASTM F15 Committee addresses all consumer products and participation in its subcommittee's activities can be done electronically. A new revision to the ASTM F1487-07ae1 is due to be published some time in 2011. The revision will include a major rewrite of the specific equipment requirements for swings. The new section will include a swing impact test method and a performance requirement. The Singapore Standard, SS 457-2007 Specification for Playground Equipment for Public Use, which is intended to guide industry and other users in relation to design, installation and maintenance of public use play equipment, incorporates the recommendations made in the ASTM 1487.

In late 2010, the ASTM F2049 Standard Safety Performance Specification for Fences/Barriers for Public, Commercial, and Multi-Family Residential Use Outdoor Play Areas became a performance standard in lieu of a standard guide. While this may appear to be a subtle change, it has significant design implications, wherein all ASTM Standards related to public play areas have to be adhered to. There are now special performance requirements defining when fencing may become a recommended requirement for a public play area. There are ASTM Subcommittee ballots currently being voted on that address requirements for the type and number of emergency access/egress gates. This standard is under the jurisdiction of the ASTM F14.10 Subcommittee, which is part of the ASTM F14 Committee that addresses many other fencing standards.

Play Area Safety Surfacing Requirements Impacting Owner's Operating Decisions

The ASTM F8.63 Subcommittee has several projects under consideration under the ASTM F8 Committee, which addresses all types of surfaces and manufactured surfacing. There are many ASTM Standards which fall within this subcommittee's scope of responsibility that impact the public play area industry. The ASTM F2223 Standard Guide for ASTM Standards on Playground Surfacing gives a brief explanation of the many standards currently in effect that impact the different types of impact attenuating surfacing systems. Many may not realise there exists several standards for the following types of play area surfacing systems:

- ASTM F1292 Specification for Impact Attenuation of Surface Under and Around Playground Equipment
- ASTM F1951 Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- ASTM F2075 Specification for the Manufacture of Engineered Wood Fibre Surfacing for Public Playgrounds
- ASTM F 2479 Standard Guide for Specification, Purchase, Installation and Maintenance of Poured-In-Place Playground Surfacing

These standards are under constant review and revision. In many instances, new standards are developed to better clarify or even expand the minimum acceptable performance requirements of the existing types of surfaces already being used within the play area industry. There is currently a new ASTM standard under development for loose rubber surface systems to determine acceptable levels of specific contaminants and foreign materials, such as tramp metal.

How to Verify Compliance to Minimum Play Area Safety Surface Standards

It may be little known that the ASTM F2223 Standard recommends several factors for consideration in selecting an impact attenuating surface for under and around public play areas. The surface system should conform to both ASTM F1487 for use zones and ASTM F1292 for impact attenuation for the fall height of individual equipment. In the USA, it is necessary to conform to the minimum performance requirements of the ASTM F1951-99 to meet the minimum requirements of the Americas with Disabilities Act ADA/ABA Accessibility Standards. Since every surface system is unique in material, formulation and composition, the source of raw materials should be tested to confirm conformance with the appropriate ASTM specifications identified in ASTM F2223, specifically F1487, F1292, F1951, F2479, and F2075.

Safety Surface Field Testing Will Document Compliance to Minimum Safety Standards

ASTM F1292 recognises children play in climates with diverse temperature ranges. Regardless of the materials used in the manufacture of the surface system under and around the play equipment, surface samples are required to be tested in a laboratory at three temperatures, 30 degrees F (-1 degree C), 72 degrees F (23 degrees C) and 120 degrees F (49 degrees C), to determine the height from which the g-max does not exceed 200 or the Head Injury Criterion (HIC) does not exceed 1000. Once either threshold is exceeded, the next lowest drop test measured in full feet becomes the Critical Fall Height of that surface. The owner operator of the play area should ensure the critical height of their selected surfacing system exceeds the fall height of their equipment. As such, it should be made known that the pass/fail recommendations for the specification are actually minimum requirements. How can one be sure what the exact temperature fluctuations might be under extreme heat or cold on any given day? When will these extreme environmental conditions render the surface system non-compliant to the minimum recommendations? How does one determine when this point of non-compliance might occur? The only concrete answer is established through field testing. The ASTM F1292 now gives a detailed explanation of how to conduct the field testing in addition to the laboratory testing requirements. The basic difference between these two is the field test is conducted at the ambient temperature of the date and time of the test at what would appear to the drop test operator to be the location most likely to fail the test. These locations might be areas of noticeable heavy use and visible wear, edges of tiles and/or seams. There are many more requirements for information required within the actual drop test report, including the recording of each of the three drops for three separate locations within the use zone of each free-standing piece of equipment and/or composite structure for each different surface system within that equipment's use zone. Digital



ABOVE & RIGHT All moving components have a bearing surface that will be sacrificed over time through normal use. Bearing surfaces must be routinely inspected and replaced before this kind of wear occurs. Failure of this link can lead to a serious accident.



photos are required to document each area tested. Weather conditions must be recorded, including the surface temperature and the temperature between one and two inches into the surface system at the time of the drop test. One additional requirement of the field test standard requirements requires the field test equipment operator to select test locations that they believe, from their experience, are most likely to fail. The surface system fails the compliance test if any of the drop test results (average of the second and third drop test results for each location tested) exceeds the thresholds of 200-gs or 1000 HIC for the fall height of the equipment, or the height specified by the owner or operator in their purchasing documents or contract, whichever is greater.

Following which, the ASTM F1292 and the ASTM F1487 require the owner or operator to document this compliance and retain these records. This documentation includes verification that the installation complied with the manufacturer's specifications and the surface is maintained within the use zone for each play structure in accordance with the standard.

Providing Access For All and New Standard Puts Focus on Maintenance Issues

In September 2010, the U.S. Department of Justice adopted the Americans With Disabilities Standard that establishes compliance requirements for the installation, maintenance, inspection and documentation of the accessible route up to and through the playground area to every accessible play component. It is now imperative that these standards be understood and adhered to in the USA. We are only beginning to realise and understand the ramifications of this landmark civil rights legislation. What are the minimum performance requirements of the accessible route? We have known the U.S. Access Board's recommendations for this route for many years. The acceptable minimum slope outside and to the play area should have a minimum width of 60 inches (1,520 millimetres) with a maximum running slope of 1:20 (5 percent) and a maximum cross slope of 1:50 (2 percent) with a minimum overhead clearance, free of any and all man-made or natural obstacles, of 80 inches (2,028 millimetres). In areas of rapidly growing vegetation, this can present a unique set of inspection and maintenance requirements to maintain this clear space and a firm, level and stable surface along the accessible route, including areas this route encroaches upon and accessible equipment use zones. Inside the play area, the running slope may not exceed 1:16 with a cross slope no greater than 1:48 and it must maintain the 80 inch (2,028 millimetres) overhead clearance. The accessible route within the use zone must comply with impact attenuation requirements of the ASTM F1292 Standard. How these requirements are measured in the field will become a challenge for those that utilise loose fill surface systems. It also presents unique challenges for those who use rubber tiles or even Poured-in-Place unitary surface systems. Expansion and contraction of almost any surface and ultraviolet radiation (UV) and thermal degradation (excessively high temperatures) can cause shrinkage, buckling and adhesive breakdown, resulting in raised edges and gaps. If any surface, within the 60 inch (1,520 millimetres) wide accessible route, has gaps, depressions or vertical raised edges of greater than half an inch, the route is considered to be non-compliant. This will be the most common compliance issue facing public play area owners or operators. Only recently have most operators and manufacturers of surfacing systems come to realise the impact of these accessible route requirements of the Accessibility Standard for public play areas. For more information, visit www.access-board.gov/us.

New U.S. Consumer Product Safety Improvement Act has Worldwide Impact

The U.S. Legislature passed a new safety law in 2010 governing all children's products. It is the Consumer Product Safety Improvement Act (CPSIA) and it impacts all manufacturers and distributors of any child product sold in the USA. In short, it sets new threshold limits for toxic substances, such as lead paint and toxic substances found in plastics. This will also impact the play equipment industry, though the exact impacts are not yet fully known or understood. For the large number of playground equipment manufacturers selling products throughout the world, this can create some interesting challenges since many children's products sold in the USA are manufactured throughout this region. This Act does not just impact the final product. It impacts each individual component used to assemble the play equipment and includes all manufactured play area surfacing systems. The lead paint content of dyes used to colour artificial turf top mats has raised concerns in the sports turf industry for several years. The CPSIA will continue to evolve as new information and research on the subject becomes known. One thing the ASTM F15.29 Subcommittee has learned as we attempt to deal with issues, such as burns from hot surfaces and exposure to toxic substances within the play environment, is that children under the age of three are most at risk to experience the negative impacts from exposure to these conditions.

All of this information is important to public play area owner and operators, as well as manufacturers, designers, installer or contractors, and those who inspect, maintain and repair these public areas for children's safety and enjoyment. This information is not just "nice to know," it is "need to know" information. All of this information comes into consideration as an owner or operator starts a planning process for a new facility. It is all very important in the analysis and final decision process of selecting equipment and safety surfacing systems for each project. It is time to allocate some of our limited and precious time to become more engaged students of these types of changes within our industry.

Green Objectives for Play Area Owners or Operators

In spite of all these changes, the one thing that has not changed and which has remained a major concern within the play area industry is the lack of or improper maintenance being performed on our public play areas. In the USA, it appears that more than 40 percent of all public playground related injuries requiring emergency room or hospital treatments have been allegedly caused by this lack of proper maintenance. Proper maintenance requires knowledge and experience of the basic play area components, from the equipment footings below finish grade to the structural components, fasteners, connectors, and fastening connectors, regardless of the materials used to create the components. Play area safety inspections must be routinely conducted by trained personnel authorised to take appropriate action to complete regular custodial type maintenance, conduct manufacturer-recommended preventive maintenance at recommended intervals, and to make repairs to prevent equipment or component failure. Thus, when the inspector identifies a piece of equipment or a component that has failed or is near failure, they are trained and prepared to take appropriate action to immediately replace the defective part, take the play event out of service, or properly shut down the entire play area, in order to avert a serious, possibly life threatening or permanently debilitating injury. This is defined by the Certified Playground Safety Inspector Course as death, brain damage, loss of vision,


loss of speech, loss of limb and loss of internal organ. Long bone fracture and broken bones of any type, while serious, are not considered to fit this definition of permanently debilitating.

The Green Solution

Returning to my earlier comment about the drive-by appearance or first impression of many public amenities, over the past ten years, I have had the privilege of visiting many countries throughout this region. There is one important issue that is almost constant throughout the region and the world. What the general public and I see from a distance appears to be very modern looking, well maintained and functional public play areas. Upon closer inspection by a trained CPSI, they will discover the need for more maintenance and repair of play components and the safety surfacing. Many components and surfacing, regardless of the manufacturer, will show moderate to extreme wear, parts will be missing or broken, and many moving parts show excessive wear and should be replaced immediately. If repairs cannot be made immediately, steps should be taken to remove the broken play component or render it unusable so it does not injure a child or create another safety hazard when a child comes in contact with the temporary repair.

My observation, if correct, can only be addressed with a commitment of resources to hire and develop better informed, knowledgeable, more experienced and trained staff or independent contractors who are charged with the responsibility to inspect, maintain and repair children's play areas.

Our industry safety standards and guidelines require us to do nothing less. Researchers have demonstrated the developmental benefits of play in a child's development. Over the years, examples of healthy playful community planning have demonstrated that these areas and other similar public spaces are a necessary amenity, which add value to any vibrant city, school, park, childcare facility or residential development. If play spaces are such a necessary component of quality living spaces, then they should receive the necessary attention and resources to preserve the quality, safety, function and aesthetics of the original design concept.

How we move forward to enhance the quality of life for all people can be summed up in how we value and address the needs of our very young and the elderly. Public safety should not be compromised. We need to make sure there is a life-cycle cost of maintenance and repair of our public spaces incorporated into the planning process, and then we need to ensure adequate resources are allocated to life-cycle maintenance and repair costs associated with any and all public spaces. As stated earlier in this article, ensuring the safety of the public, maintaining the function of the facility, and reaching or surpassing the intended life-cycle of the capital investment are some of the most basic green objectives for the owner or operator. I suggest we make sure we allocate approximately ten percent of the cost of the project to the annual inspection, maintenance, and repair of the area. In addition, I suggest we provide the necessary training to those responsible for the day-to-day management of these areas. Over time, we will be able to evaluate the outcome and adjust our efforts accordingly. 



**Own the
Ultimate Resource on
the Proper Care and
Maintenance
of Playgrounds**

www.internationalplaygroundsafetyinstitute.com

Fourth Edition
Kenneth S. Kutski, CPSI
International Playground Safety Institute, LLC

This publication has been an integral component of the National Recreation and Park Association's Certified Playground Safety Inspector Course and Examination since 1994. For more information on how to attend this course in Singapore or in the USA you should contact

Chew Thiam Kwee, Head, Safety Programmes, CUGE
chew_thiam_kwee@nparks.gov.sg

Kenneth Kutski, Executive Director, IPSI, LLC
ken@internationalplaygroundsafetyinstitute.com

We are reminded constantly by emergency room statistics how important playground safety is for children. In the current state of our nation, some playgrounds are being removed without replacement because they are weathered, and funding for replacement can be scarce. Play in general is endangered with recess reduced or alleviated, and some elementary schools across the nation are actually being built with no plans for a playground for various reasons. Play has more impact on society than most realize.

As editor of *Playground Magazine*, and a mother of three active sons, I have become increasingly aware of the challenges faced with designing, installing and maintaining safe play spaces for children. There are solutions to combat these challenges, and little by little we can make a big difference—especially concerning the ripple effect of proper or improper playground maintenance.

Owners and operators of playgrounds play a pivotal role in, and share a great responsibility for making sure playgrounds are not only safe, but fun, challenging, clean, attractive, and that place where children can learn and grow no matter their physical ability.

Playground Safety is No Accident is a very useful resource, providing those responsible for design, installation and maintenance information needed to ensure proper care and maintenance of playgrounds. The impact of development that takes place on the playground should remind us that it behooves us all to make sure we are providing the best possible play environment to foster safe and healthy development for children—physically, socially, intellectually and emotionally. It all starts with a playground, experience that later shapes our society.

Shannon Amy Stockwell
Editor, *Playground Magazine*
2008 Apex Award for Publication Excellence Recipient