



PLAYGROUND ADVISORY

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Using Performance Based Standards

.Playground surfacing should be the simplest item in the world to procure, but it never fails that the Owner, the Landscape Architect, General Contractor and others are surprised when the surface fails and the supplier says with a straight face, “it meets spec”.

Protective surfacing around the world is governed by standards and each jurisdiction will have a set of standards or reference other national standards. As important as knowing which standards to quote is understanding the types of standards that exist and what they cover, whether they are performance based or guides, and whether they provide the protection the owner and user expect from their protective surfacing. This article is to provide an understanding of the relevant and non-relevant standards that are quoted in North America and what they mean to the owner and user. Readers of surfacing manufacturer/supplier literature will be exposed to many standards that have at some time been performed and since they are paid for why not continue to keep the meaningless data on their literature. Some of these are not relevant such as ASTM D530, D2444, D3137, D412 and depending how they are referenced ASTM F2479 and others. Searching Standards Bodies websites such as CSA

and ASTM is free and the validity of a Standard to a situation can be determined.

Failure to write a comprehensive specification could mean a failed surface and liability for the Owner and the designer/consultant. Additionally depending upon the jurisdiction, a failure might place the owner, designer or supplier in non-compliance with federal, state, or provincial mandates that could require removal of the protective surfacing at their cost and/or fines.

The first step is to distinguish between types of standards and mandates. Standards for playgrounds in North America are published by ASTM (American Society for Test Materials) International (www.astm.org) and CSA (Canadian Standards Association) International (www.csagroup.org). These organizations set out the procedures and manage the development of standards using a consensus process. Once a standard is first published, it continues to be open for revision and must be revised, reaffirmed, or abandoned within a certain period of time. Standards are one of a five types; Specification, Practice, Method, Guide or Classification and each type is very distinct and has a place within the environment. Playground Standards are typically specifications or guides and it is important to distinguish between the two and referencing them inappropriately. Specifications can provide test methods, and will always provide the performance criteria that are measurable. In public playgrounds these specifications include ASTM F1487, ASTM F1292, ASTM F1951, ASTM F2075, and CSA Z614 and are the only documents that can be required for compliance in a playground specification.

In playgrounds there are also guides, providing information and assistance to the reader to make better choices and improve the products or services. These



include the ASTM F2223 and the ASTM F2479. One of the unique aspects of a guide is that they do not contain requirements or measures of performance. As a result someone claiming compliance to either of these two guides is demonstrating their lack of professionalism and quite honestly are misleading the reader and setting up those they encourage to include compliance to the guide in a project specification to embarrassment. The biggest problem with demanding compliance to a guide rather than a specification will leave the project without any performance requirements and any state of completion must be accepted by the owner and designer/specifier.

One way to use a guide would be to consider section 7.2 of ASTM F2223 “Lower values of g-max



and HIC signify better performance for impact absorption.” This information would be used in conjunction with section 4.4.3 of ASTM F1292, the specification, “The specifier is permitted to specify additional impact attenuation performance requirements, providing that such additional performance requirements are more stringent than the performance requirements of this specification.” This would allow a landscape architect or owner to specify a Gmax <100 and HIC <570 for structures intended for children under 5 and a Gmax <100 and HIC <700 for structures intended for children from 5 to 12 years old. The second step would be for the

landscape architect or owner to comply with their obligation under ASTM F1292 sections 4.4.1 and 19.1.1 to stipulate the drop height prior to purchase to clearly state that the drop height will be the top of all climbers, swings, upper body equipment, guardrails and barriers for the protective surface that is being installed.

An analogy of how guides and specifications work together that most adults will understand is the purchase of vehicle tires. The Standard Specification will state the minimum amount of tread allowed for a tire to be used on a public road. Guides and common sense lead purchasers to demand or specify significantly more thread than the minimum and this has been adopted by manufacturers as a matter of practice to provide miles or kilometers of driving before replacement. If we all understand this why are playground owners, specifiers and consultants constantly specifying the limits of the Standards and starting their playgrounds out on bald tires only to blow out within a very short time after installation.

The astute professional will be asking, “but I specify compliance to ASTM F1487 or CSA Z614, why am I



looking at all of the other Standards” and they might be right until we look deeper into these Specifications. ASTM F1487 requires that the protective surface within the use zone comply with ASTM F1292 in sections 3.1.30, 3.1.51, 7.1.1, 9.1.1, 11.2.2, 13.2.1 and covers the protective surface from layout to installation to the entire life of the playground and

maintenance. Conversely the CSA Z614 requires that the performance of the protective surface provide a $G_{max} \leq 200$ and $HIC \leq 1000$ using the test method and device in ASTM F1292 and that should the surface fail to meet section 10, it must be replaced. This referencing and cross-referencing of one specification to another allows for the technical requirements to remain in one document and in turn strengthen the other document. This might also allow developers of F1487 to one day set their own pass/failure for the protective surfacing as tested to ASTM F1292. As a result the protective surface must comply at the time of installation and at any time during the life of the playground. This is why taking the advice of a best practice suggested in a guide for more stringent performance allows for the long-term compliance to the standard and a better project for the owner.

Another major aspects of Standards are notes, annexes and appendixes. This is where ASTM and CSA diverge. In ASTM Standards, a note follows a section and provides additional non-mandatory and guidance information, whereas an appendix provides the same for the entire document. An Annex in ASTM provides mandatory detailed information that supplements the main document. In CSA Z614 notes are used in the same manner as ASTM, however the Annexes are non-mandatory and provided for information and explanation only. The Annex in CSA may be in non-mandatory or mandatory language as in Annex H on Accessibility in the playground. The use of mandatory language in Annex H allows a Landscape Architect, Owner or Government Regulator to require compliance to Annex H and have measureable performance in the project specification and the enforcement becomes the regulation or contract..

Now that we have a better understanding of Standard Specifications, Guides, Notes, Annexes, Appendixes and how they cross-reference each other, it's time to consider the validity of their use, particularly in relation to the Standards writing group, ASTM or CSA. These are all voluntary standards, which specifically mean that for the CSA Standard, there is no certification program under CSA.

If Standards are voluntary, what is it that they do?

They set minimum performance and since they are built on the basis of consensus, which is essentially a spiralling down until 50% plus one or more person agrees. They are regularly used in the courts to set the minimum standard for the determination of liability and negligence although the courts can require better than the minimum performance if there is a direction in the standard to consider a better practice. Standards are also regularly mandated in federal, provincial, state, municipal, public health regulations, etc. and are therefore enforceable on the owner of the playground. The most important current mandate for playground standards is the inclusion of the ASTM F1292 and ASTM F1951 as requirements for the accessible route in the US Department of Justice 2010 ADA Standards for Accessible Design. Other mandates have included, since 1998, the requirement for Child Care playgrounds in Ontario, Canada to comply with the CSA Z614. Mandates give back bone and enforcement to the performance requirements of the standard.

Landscape Architects and specifiers typically rely on others to assist in the development of specifications and therefore believe they can hold suppliers responsible for the detail and compliance. This, as we have seen, could be a big mistake if the anticipated perfor-



mance of an owner or mandate is not met or a child is injured as a result of a failed specification. This could lead to significant liability that is unanticipated and the Landscape Architect or specifier will have little or no recourse to the supplier that provided the erroneous information.

Inspection and testing are extremely important to determine compliance with contracts and specifications. If Standards are performance based, what role does professional judgement have in the inspections of the playgrounds to named specifications? Specifications provide performance criteria, test methods and pass/fails that are clearly measurable. It is not the role of the inspector engaged to perform an inspection to a Standard to re-write the Standard during the test for the convenience of the client, suppliers or owner. An inspection should be a clear portrayal of the Standards using all of the tools, devices and methods provided and report the results. Failure to perform the inspection to the requirements of the Standards or not performing the required tests or not using the prescribed devices in the manner laid out, the inspector has stepped outside their professional obligation and could be found to be negligent if the project is deemed to need replacement or repair as a result of non-compliance or an injury has occurred. Professional judgement on the part of the inspector comes following the results of the inspection in assisting an owner in assessing the significance of a failure and prioritizing repairs. Ultimately the choices and decisions are the responsibility of the owner/operator.

Standards are important and critical to success of the playground project. It is the responsibility of everyone involved in the process to ensure compliance at or better than the requirements of the standards. For playground surfacing that is known statistically to result in serious, debilitating and a 16% risk of AIS>4 (life-threatening with survival probable), it is incumbent on the Landscape Architect, designer, specifier, owner and suppliers to take a lesson from the tire purchase analogy above. Since the surface must never exceed Gmax of 200 and the HIC must never exceed 1000, Guides, Common Sense and performance standard Specifications would suggest that these values at the time of installation should be less than half of the limit and the drop height should reflect the reasonably foreseeable activities of children.

Enjoy your playground.

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Standards News

Standards are constantly under revision and Playground standards around the world are in various stages. The Canadian CSA Z614 is currently in the final stages of publishing and should be out for the spring of 2014. In the meantime ASTM F1487, last published in 2011 is working towards a hazards based approach, while ASTM F1292 is balloting the lowering of the HIC to 700. Additionally ASTM is moving closer to publishing an outdoor fitness standard based on a combination of the multiple indoor fitness standards and the ASTM F1487 requirements. This standard is anticipated to go to ballot this year.

For those interested in the ASTM process, the F08 meeting week, including F15.29 is meeting in Toronto, Ontario in May of 2014.

The playground standards for surfacing in both Europe and Australia are gathering their committees and subject matter experts to begin their revision process. Some of this work should reflect the Playground Safety Day, hosted by TUV Austria in October 2013. The press release can be found at http://www.tuev.at/start/browse/en/Webseiten/TUV%20Austria%20Holding/News/tuv-austria-spielgeraetetagung_2013_en.xdoc. The emphasis of this conference was lowering impact values to reduce both TBI and long-bone fractures and more frequent testing of surfaces in the field.

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