Accessible Play Area Surfaces:
A Brief Overview of Practical Application of the ADA

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Abstract

With the publication of the revisions to the Americans with Disabilities Act's (ADA) title II regulation on September 15, 2012, the 2010 ADA Standards for Accessible Design were adopted. Those became fully enforceable standards for implementation of the ADA on March 15, 2012. Included in those standards, for the first time, are scoping and technical provisions for recreation facilities. Probably the most common of those facilities and the one most available to the public on a daily basis are playgrounds in public parks. The standards require some ground level and some elevated play components at play areas to be located on accessible routes with accessible floor/ground space and turning space. While there is significant complexity to the technical provisions overall, the requirement that has been most problematic is the requirement for compliant surface materials in those limited areas of playgrounds required to have characteristics that provide both safety (*i.e.,* fall attenuation) and accessibility (*i.e.,* stable and firm surface allowing the use of mobility devices such as wheelchairs, walkers, and canes).

The standards require compliance with ASTM (American Society for Testing and Materials) measurement protocols, incorporated by reference, for surface safety and accessibility. These protocols define the measurement of shock absorbing characteristics of safe surfaces and work force characteristics of accessible surfaces. Various materials have been tested for these characteristics in an effort to identify those that are safe, those that are accessible, and those that are both safe and accessible. While materials have been measured in the laboratory to determine whether they have either or both characteristics, having both characteristics does not confer the label "ADA Approved". No entity is legally authorized to apply that label. Nevertheless, many manufacturers continue to label their surface materials that have laboratory measurement characteristics consistent with ADA safety and accessibility requirements as, "ADA Approved".

Considerable research has been completed by the U.S. Access Board, the National Center on Accessibility (NCA), and the U.S. Forest Service to identify materials that can consistently provide accessible properties in outdoor environments. In some cases the use of given materials is for aesthetic purposes – such as trails – but in many cases the materials must also conform to fall protection properties needed on playgrounds. NCA has recently delivered a final report on its longitudinal study conducted at a number of playgrounds in the Midwest over a five-year period. Meeting the Challenge has conducted functional surveys of hundreds of play areas in Colorado and Wyoming to determine whether observed surfaces had characteristics that would provide sufficient firmness and stability to allow access to individuals using mobility devices. The intent of this document is to synthesize the technical requirements, the scientific research, and the practical experience to give informed guidance to entities having responsibility for providing accessible playgrounds.

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Background

Why do we need accessible playgrounds for children with disabilities? "The design, installation and maintenance of play equipment and the surface material is critical to achieving an inclusive environment that facilitates child development and enables children with disabilities to fully participate with their non-disabled peers."[i]

The *2010 ADA Standards for Architectural Design* (2010 Standards) define the minimum scoping and technical provisions for accessibility in the built-environment as required by the Americans with Disabilities Act. The 2010 Standards which became effective on March 15, 2012, replace the 1991 ADA Standards (also known as the ADAAG) and the Uniform Federal Accessibility Standards (UFAS). The 2010 Standards, while they do revise some of the former requirements and create supplemental standards for additional facilities (such as play areas, swimming pools, and golf courses) essentially build on the basic anthropometrics of the older standards. The basic elements of accessible built-environment are referred to as *building blocks*. These *building blocks* are inherently derived from an understanding of those aspects or traditional buildings and construction practices that have presented physical barriers for people with disabilities. These minimum spaces and clearances to accommodate people with disabilities are organized in Chapter 3 of the 2010 Standards.

The intention of accessibility standards is to design new structures without these barriers. Renovation and alteration to existing structures should also, when feasible, eliminate such barriers. The building blocks define basic spaces in the built-environment in a way that precludes construction of new structures or alterations to existing structures that prevent or limit access for people with disabilities.

Until the adoption of the 2010 ADA Standards, recreation specific facilities and elements indoors and especially those outdoors lacked standardized measures of accessibility. However, the lack of standards did not relieve places of public accommodation[ii] or public entities[iii] from their obligations to comply with the ADA's prohibition of discrimination on the basis of disability. This lack of standards contributed to a great deal of confusion for private businesses that were required to provide non-discriminatory access to "the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation". Similarly, public entities often found themselves negotiating in the gray area of the need for and limits of program access. Public entities consistently had difficulty in determining how to make programs accessible. Alternatives to physical barrier removal such as modification of policies, change of venue, and other means of delivering services have been employed to prevent discrimination in accessing services, programs, and activities *viewed in their entirety*[iv]. Public entities can offer special programs to accommodate people with disabilities however, they must also "administer services, programs, and activities in the most integrated setting appropriate to the needs of qualified individuals with disabilities."[v]

With the advent of scoping and technical provision requirements for recreation facilities found in the supplemental standards of the 2010 ADA Standards, the evaluation of access to recreational services, programs, and activities is significantly more objective. The standards specify the minimum measures that must be taken to make recreation facilities accessible. Where, when, and how much of a playground must be accessible is specified. The vague and nebulous parameters of non-discriminatory access to programs of public entities are demystified. Well almost.

There have been a variety of pressures for recreation professionals to make playgrounds *both* safe and accessible. In many respects, these two objectives can be seen as contradictory, if not mutually exclusive. The following discussion will attempt to interpret and clarify the confusing and often conflicting information and ideas surrounding the implementation of the requirements of the 2010 Standards for accessible play areas, specifically those defining compliant surfaces. The scoping and technical provisions for recreation facilities articulate the intent of the ADA to provide non-discriminatory opportunities to access recreational services, programs, and activities for people with disabilities. Access to public programs applies to all members of the public including parents, grandparents, siblings, or guardians who have disabilities in addition to children who have disabilities. While the standards require an approximate percentage of types and dispersion of play components as the primary goal of accessible play areas, in the real world application, the surface – or some portion thereof – is literally foundational in achieving that goal.

For recreation professionals, the choice of material, understanding of proper installation, and management of ongoing monitoring and maintenance present considerable challenges. Skulski and York conclude, "there is no perfect playground surface"[vi]. The surface materials that work best for accessibility are not safe. The surface materials that work best for safety are not accessible. Inevitably, we must compromise to find surface materials that can and will serve each purpose and both purposes. Critical to this compromise is the understanding that there are three types of surfaces required in a compliant play area: 1) safe (impact attenuating) surfaces in use zones, 2) accessible (stable, firm, and slip resistant) surfaces within routes and clear ground spaces for those play components required to be accessible, and 3) safe *and* accessible surfaces where use zones and accessible routes coincide. Essential to making decisions that deliver the best results both in terms of compliance and economics is a thorough understanding of where and why given surface materials must be applied (or not).

"ADA-Approved" Surfaces

Recreation professionals are not alone in seeking to procure products and materials that have a stamp or certification that confirms product compliance. Architects and contractors search for "ADA-certified" plumbing appliances and handrails. Administrators want "ADA-compliant" boilerplate for their policy and procedure manuals. The simple fact is that while those labels exist and some of those products may be used to comply with the Americans with Disabilities Act's many regulations, there is no federal government entity that is authorized to sanction products, materials, or policies as "ADA-approved".

ADA Standards

The ADA Standards are a set of scoping and technical provision rules that specify the minimum requirements for accessible design. These rules are based on guidelines developed by the U.S Access Board. Guidelines become standards when the authorized enforcing entity adopts them through regulation. The 2010 ADA Standards, as adopted by the U.S. Department of Justice, incorporate by reference[vii], the following standards of the American Society of Testing and Materials:

> ASTM F 1292-99 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment (see 1008.2.6.2).
>
> ASTM F 1292-04 Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment (see 1008.2.6.2).
>
> ASTM F 1487-01 Standard Consumer Safety Performance Specification for Playground Equipment for Public Use (see 106.5).
>
> ASTM F 1951-99 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment (see 1008.2.6.1).[viii]

The 2010 Standards define accessible surfaces and specify where those surfaces must also meet fall attenuation standards, as well as specifying the properties of those surfaces, by referencing the ASTM Standards:

> 1008.2.6 Ground Surfaces. Ground surfaces on accessible routes, clear floor or ground spaces, and turning spaces shall comply with 1008.2.6.
>
> *Advisory 1008.2.6 Ground Surfaces. Ground surfaces must be inspected and maintained regularly to ensure continued compliance with the ASTM F 1951 standard. The type of surface material selected and play area use levels will determine the frequency of inspection and maintenance activities.*
>
> 1008.2.6.1 Accessibility. Ground surfaces shall comply with ASTM F 1951. Ground surfaces shall be inspected and maintained regularly and frequently to ensure continued compliance with ASTM F 1951.
>
> 1008.2.6.2 Use Zones. Ground surfaces located within use zones shall comply with ASTM F 1292 (1999 edition or 2004 edition).

The standards do not identify specific materials, such as engineered wood fiber (EWF) or poured-in place (PIP) surfaces, as being compliant. By reference, the standards provide a method for measuring materials to identify, assess, and determine whether they meet the minimum requirements for stability and firmness, as indicated by the measurement of wheelchair work (work per foot) for straight propulsion and turning on a given surface. The average work values for test trials on a given surface are compared to work values on a "hard, smooth surface with a grade of 7.1 +/- 0.2% (1:14) and a cross slope of 0 +/- 0.5%.)"[ix]. Those surface materials for which the average work values exceed the average work value for the control surface are not compliant with ASTM F 1951-99.

The testing standard explains that accessible surfaces (those not exceeding the work value of ASTM F 1951-99) must also comply with fall attenuating values (as established by ASTM F 1292-04) where accessible surfaces coincide with use zones (established by ASTM F 1487-01). A level concrete sidewalk will probably produce work values not in excess of the maximum work value established under ASTM F 1951-99. However, a concrete sidewalk cannot comply with the fall attenuating value established under ASTM F 1292-04. And logically, loose fill wood chips when provided at a sufficient depth will probably have fall attenuating properties that comply with the fall attenuating values established under ASTM F 1292-04, but cannot (under normal conditions) produce a wheelchair work value that does not exceed the maximum work value established under ASTM F 1951-99. Materials that can meet both accessibility and fall attenuating properties are often *casually* termed “ADA-approved”.

Identifying “ADA-Approved” Surface Materials

The term “ADA-Approved” as used by Mike Marshall, Loss Control Consultant at the Utah Department of Risk Management , on *Playground Surfacing Materials, ADA-Approved and Non-Approved*, is typically used in reference to a material that when properly installed can/has passed the ASTM trials for both accessibility and fall attenuation. The ASTM standards, as Marshall observes, “do not identify specific materials.”[x] Marshall compares the relative functional abilities of loose fill versus synthetic materials to comply with accessibility and fall attenuating abilities, noting the pros and cons of each type of material.

With regard to shredded rubber and engineered wood fiber, Marshall states: “Both of these products are ADA-approved for both mobility and impact attenuation.”[xi] This is rather a misleading statement as it implies that a federal agency (the *ADA*?) with enforcement authority established by the Americans with Disabilities Act has affirmed, certified or otherwise approved a specific product (or type of product) as meeting or exceeding the accessibility requirements of the ADA. Affirmation, certification or approval of any product has not been, and will not be, provided by any federal agency such as the U.S. Department of Justice or the U.S. Department of the Interior. The use of terms such as *ADA-approved*, *ADA-certified*, or *ADA-compliant*, in the context of having specific government sanction is not authorized. To be clear, there is no entity called the *ADA*. What Marshall actually means is that under laboratory test conditions, when properly installed, these materials have passed ASTM F 1951-99.

It does not mean that engineered wood fiber, shredded rubber, or even poured-in-place urethane that has been installed improperly or that has not been properly maintained will provide a surface with required properties for stability and firmness on a given day in the real world. Further, the suggestion that “daily raking” will sufficiently maintain such materials is contrary to any practical understanding of the stability of a surface. Raking may level the material and provide a consistently sufficient thickness to ensure fall attenuation, but it is as likely to degrade stability as it is to improve it. Stabilizing loose fill materials is accomplished by compaction and typically compaction that includes adding water to layers of materials such as engineered wood fiber. Experience on the ground indicates that raking engineered wood fiber has a negative impact on surface stability.

It is a given that installed surfaces (maintained over time) must meet the ADA requirements, as measured by the ASTM standards, for on-site accessibility. Playgrounds *are* or *are not* accessible on a case-by-case basis. No material is inherently "ADA-compliant". For comparison, a door 36 inches wide is not "ADA-approved". When that door is installed to provide a clear opening width of 32 inches, vertical clearance of 80 inches, minimum push and pull side maneuvering clearances, with closed-fist operable hardware, and requires opening force no greater than 5 pounds, then that door can be an element of an (ADA) accessible route. Without being installed on-site and meeting all of the parameters, neither the door nor the doorway in which it is installed can be considered to be "ADA-compliant".

Accessible Surfaces

The purpose of ASTM F 1951-99 is to provide a method for identifying materials that are potentially capable of producing "playground surfaces that are firm and stable, and if within the use zone, resilient, thereby enabling use by people with mobility impairments"[xii]. The ADA's building block requirement for accessible surfaces is given in section 302 of the 2010 Standards:

> 302.1 General. Floor and ground surfaces shall be stable, firm, and slip resistant and shall comply with 302.
>
> *Advisory 302.1 General. A stable surface is one that remains unchanged by contaminants or applied force, so that when the contaminant or force is removed, the surface returns to its original condition. A firm surface resists deformation by either indentations or particles moving on its surface. A slip-resistant surface provides sufficient frictional counterforce to the forces exerted in walking to permit safe ambulation.*[xiii]

Researchers Laufenberg and Winandy, in a December 2004 report on Phase III of their study of accessible playground surfaces, stated: "The ADA criteria for accessible surfaces have not been defined adequately within the ADA accessibility guidelines for quantitative measurement on any specific surface."[xiv] The guidelines they reference are the *2004 ADA/ABA Accessibility Guidelines* which have since been adopted with only minor changes as the 2010 Standards. Essentially, this observation highlights the difficulty of objectively identifying the compliance of a surface that meets the ADA's accessibility requirements and simultaneously meets the safety requirements of ASTM F 1292-04.

Accessible Exterior Surfaces, Axelson and Chesney

Axelson and Chesney's research in 1999, evaluated 16 different trail surface materials, including two types of engineered wood fiber (EWF) and wood chips. The EWF samples demonstrated the highest wheelchair work values for both straight propulsion and turning. While rating at the high end of *moderately firm* both types of EWF ranked at the low end of *moderately stable* in Rotational Penetrometer testing. Sand alone, as a surface material, scored significantly worse than EWF in both firmness and stability. Both types of EWF performed worse – in the low range of *moderately firm* – when wet. Both types of EWF had lower stability scores – one ranked at the low range of *moderately stable*, the other in the *not stable* range – when wet. Even wood chips (chipped brush, average size 3x1x1 inch, compacted to a depth of 5 inches) scored higher than both types of EWF in all trials with the exception of the Rotational Penetrometer test for stability, where one of the types of EWF scored very slightly better than the wood chips. Of all the materials tested, only sand had higher *average energy consumption* rankings for manual wheelchair users than both types of EWF.[xv]

Axelson and Chesney's study was primarily intended to measure the relative functional properties of trail surfacing materials, however, the correlation between measured values for stability and firmness and the amount of work needed to travel and maneuver on these surfaces is transferable to playgrounds. It must be noted that playgrounds do not typically require the sustained effort that trails do. Axelson and Chesney's comments and conclusions include the following:

- As the surface became less stable (Rotational Penetrometer displacement increased), the energy cost for wheelchair users increased more dramatically than for ambulatory individuals with and without disabilities.[xvi]
- Ambulation tends to be more difficult (i.e., increased energy consumption, higher ratings of perceived exertion, higher levels of difficulty ratings and decreased velocity) on wood chips (CPBR), engineered wood fiber J (EWFJ), and engineered wood fiber K (EWFK) surfaces.[xvii]
- The low energy costs for manual wheelchair users on surfaces that were objectively measured as firm and stable increase dramatically on the surfaces that were not measured as firm or stable.[xviii]

A Longitudinal Study, Skulski and York

To date, the most thorough and comprehensive study on playground surfaces has been conducted by Skulski and York at the National Center on Accessibility (NCA). A wealth of knowledge on the subject can be extracted from their work. Jennifer Skulski is one of, if not, the leading pioneer in the study of playground accessibility. Meeting the Challenge staff owe a great deal of their collective knowledge on the subject to the training and research that she has provided.

NCA's ongoing longitudinal study provides preliminary empirical data that both informs and confirms the practical consulting and implementation work done by Meeting the Challenge. NCA's study compares performance on active playgrounds where four types of surface materials have been installed. The surfaces included in their research are engineered wood fiber (EWF), poured-in-place unitary surface (PIP), tiles or matting (TIL), and hybrid surface systems (HYB). Surfaces fell into broad categories of loose fill (EWF and SR), unitary surfaces (PIP and TIL), and combinations of loose fill and unitary surfaces (HYB). No playgrounds using shredded rubber (SR) loose fill were made available for this study. The study includes 25 public park playgrounds in the Midwest.[xix]

NCA measured and rated surfaces on the basis of Surface Deficiency Scores (SDS). An SDS is an averaged value for the distance in inches that a surface is affected by force exerted and measured with a Rotational Penetrometer, which approximates the change to a surface that would result from the caster wheels of a wheelchair. Earlier trials, including Axelson and

Chesney's study have demonstrated a positive correlation between the stability and firmness values, as measured by a Rotational Penetrometer, and the wheelchair work force necessary to travel across and maneuver on a surface. For example, the twisting force of the Rotational Penetrometer measures the relative stability of a surface, by measuring the depth of any change left at a surface after the exertion of force.[xx]

Rotational Penetrometer twisting to measure stability

The study reports the status of play areas within 12 months of surface installation. Significant differences were found in the number of deficiencies between EWF and the other three surfaces.[xxi]

> The greatest number of deficiencies in the playgrounds surfaced with EWF was identified along the accessible route connecting play elements, at climbers and other ground level components.
> EWF surface locations with greater surface area, such as the accessible route connecting play components had more occurrences of uneven wear, while play components meant for aggress or egress showed more signs where the 30 x 48 inch clear floor space had displaced surface material such as the "kick out" area at the ground level components, the bottom of slides and swings.[xxii]

The specific areas that are required to have accessible surfaces – the accessible routes to and clear ground spaces at accessible ground level play components – are the areas that have the greatest deficiencies with EWF surface. Mean EWF stability measurements were in the low range of *moderately stable*, while the other three surfaces ranked in the *stable* range.

> The mean for stability remains under .50 inches for the three types of unitary surfaces, while the loose fill, EWF, has a mean for stability of .78 inches.[xxiii]

The range of stability measurements for unitary surfaces was from .04 to .06 inches, while the loose fill, EWF, had a difference of .44 inches. EWF had the highest standard deviation for stability. "The high standard deviation for EWF raises questions whether the material characteristic for stability and its high variability can serve as a preliminary indicator that surface types with greater variance will require additional maintenance over time." While the study found significant difference between the stability of EWF and PIP, they do not have statistically different values for firmness. The theory that the sum of Rotational Penetrometer readings for firmness and stability could be used to set a "pass/fail value for the field test" arose during the study. TIL had the lowest mean (.60) for the sum of firmness and stability and EWF had the highest mean (1.07).[xxiv] EWF consistently presented the least accessibility of the surfaces measured in this study.

> The playground sites in the sample with EWF experienced the greatest frequency of high Surface Deficiency Scores and mean for firmness and stability. Every playground installed with EWF was observed with undulation across the horizon of the surface area. The undulating surface material created changes in level, running and cross slopes exceeding the maximum allowable standards resulting in non-compliant accessible routes to play components. There was no observational difference in the issue of undulating surface between sites installed by maintenance personnel compared to sites installed by contractors.[xxv]

Certainly, installation and maintenance of EWF surfaces was a factor. Insufficient surface compaction appears to have been a causal factor. The researchers noted, "a serious departure from the installation procedure used on the lab test samples for ASTM F1951, where the surface material is installed in 3-6 inch layers, watered, raked, compacted and installed with another layer following the same procedure and finally compacted with either a drum roller or mechanical tamper."[xxvi] This made researchers consider whether fully compacted EWF would have scored better for firmness and stability.

The unitary surfaces were not without problems. Though it may be a generalization, it appears that unitary surfaces while producing better firmness and stability scores than loose fill, had some problems with resilience and durability. One PIP surface was non-compliant, having HIC (Head Injury Criterion) scores much higher than the 1,000 maximum allowed by ASTM F 1292-04.[xxvii] Researchers determined that the failure was due to improper installation. Tile (TIL) also scored well for firmness and stability, however:

> There were reoccurring instances where the TIL had punctures holes ranging from .50 inches to more than 2 inches in diameter and where the seams had started to shift or buckle creating openings and changes in level along the accessible route.[xxviii]

To summarize NCA's study to date, concerns were found with all surface materials in the field (except shredded rubber, for which no samples were available to the researchers). "The qualitative data from the on-site inspections support the perceived advantages and disadvantages of the unitary and loose fill materials as described in the literature review."[xxix]

EWF had problem areas at swings in kick-out areas, with undulating surfaces resulting in excessive slopes, and the most deficiencies in firmness and stability scores (*i.e.*, values that indicate greater work force). There was significant correlation between the number of deficiencies and the sum of firmness and stability values. Installation neither up to manufacturer's instructions nor procedures for ASTM laboratory trials was observed. Surfaces with the least deficiencies for firmness and stability did not always comply with safety requirements. The relationship between cost and performance of surfaces was inconclusive.[xxx]

"Visual inspection alone cannot determine if the playground surface is accessible and impact attenuating in accordance with the ASTM standards."[xxxi] This was particularly true for impact attenuation, but researchers also noted the need for "a portable field instrument to determine compliance for ASTM F1951."[xxxii] Few if any playground owners have or use a Rotational Penetrometer. Test equipment used in laboratory settings to determine wheelchair work forces are expensive and not suitable for field use.

More education is needed for playground owners. "Playground owners need to become educated on, not only the minimum safety and accessibility standards, but the practical application of the standards to the newly installed playground surface in order to inspect the surface and ensure it is compliant."[xxxiii] Better dissemination of information regarding accessibility and safety performance, installation and maintenance requirements and cost would assist owners to make better purchasing decisions.

Notes from the Field: Meeting the Challenge's Play Area Surveys

Subsequent to inspections of more than 250 play areas and analyzing the field data for compliance with ADA standards, the entire implementation services crew at Meeting the Challenge would agree with the Skulski and York conclusion, "there is no perfect playground surface"[xxxiv]. We would also observe that only a small fraction of play areas – probably less than 2 percent – have surfaces that would possibly require precision measurement to determine whether or not they are accessible (*i.e.*, surfaces for which brief visual and physical inspection cannot conclusively assess properties of stability, firmness, and slip resistance). In most cases, those surfaces (for which brief on-site inspection is inconclusive) are PIP or tiles that have degraded. Apparent vandalism and weather-wear on PIP surfaces are typical observations in these cases.

Tile surface has curling edges, gaps, and excessive cross slope. Loose fill (pea gravel) contaminates the tile surface.

Loose, buckled, and/or curled edges are common where tile/matting surfaces have been improperly installed or inadequately maintained.

EWF at transfer platform within a week of installation

We have to date seen no evidence in the field of EWF freshly installed or meticulously maintained that could convince us that the surface in any key location was sufficiently stable. Loose fill surfaces of sand, pea gravel (squeegee), and mulch offer no evidence of stability.

We have not seen any application of shredded rubber as a loose fill surface and therefore can offer neither observations nor conclusions regarding its properties of stability, firmness, slip resistance, or impact attenuation. We have seen one very good example of what appears to be stabilized EWF (SEWF) in Cheyenne, Wyoming. The surface was smooth, firm, stable, slip

SEWF with integral mats at wear spots under swings

resistant, and resilient. Thick rubber mats were integral to the surface at key wear spots such as under swings. There are some minor issues with cross slopes that probably fall within construction tolerances for the material.   This surface was observed initially within 3 to 4 months of installation and again about 12 months after installation. While we did not conduct objective measurement of impact attenuation of the SEWF surface, the "feel" of the surface gave no reason to think that the surface was not safe, particularly because all play components at the play area are ground level play components.

Perhaps ironically, the most stable surfaces in play areas where EWF has been installed are typically found underneath swings. At such locations, the loose fill material has been scraped clean to a depth of 6 inches or more and the resulting surface is generally hard enough to be stable, firm, and slip resistant. However, the resulting surface in such locations is probably not providing required fall attenuation. In general, play areas with EWF surfaces are not meaningfully measurable for slope, simply because the material is heaped up in one place and dished out in another. Measurements to assess compliant heights of transfer platforms and seats or entry points of ground level play components are similarly meaningless as the surface height is inconsistent and transient in nature – in essence, the very definition of unstable.

Additionally, other observed conditions have included EWF, pea gravel, and other loose fill materials saturated with rain or snow-melt and frozen solid. Again, ironically, such surfaces appear to have sufficient stability and firmness (if not slip resistance) to be wheelchair accessible. Unfortunately, the fall attenuation properties of frozen-solid pea gravel are probably not sufficient to comply with the ASTM standard.

The greater challenge, between accessibility and safety, is to determine whether a surface is safe and complies with the impact attenuation standard (ASTM F 1292-04). Brief visual and physical inspection of a play area's surfaces can confirm that a surface *is not* safe, but cannot objectively conclude that a surface *is* safe. The surfaces most likely to be compliant for accessibility – *i.e*., PIP and tile surfaces – are the same ones for which it will be most difficult to make a determination of safety compliance. However, park and recreation professionals are typically more aware of safety concerns and have one or more of their staff who have received certified playground safety inspector (CPSI) training. Our general impression is that recreation professionals are significantly more cognizant of safety requirements than accessibility (ADA) requirements.

In some cases it might be appropriate to presume that EWF or other loose fill material that was obviously *not stable* was at least *safe.* That is almost certainly not the case in all instances. Some parks and recreation personnel have asserted that regular inspection and maintenance is conducted at play areas. On further inquiry, invariably the maintenance is performed with a rake, usually to drag loose fill material back under swings and other play components. As previously noted such raking may accrue safety benefits but is more likely to decrease than to improve accessibility. Compaction of material will improve stability; raking and "fluffing-up" can only make it less stable.

Regardless of survey results of surface inspection for accessibility and safety, at a given date, the 2010 Standards (1008.2.6.1) require regular and frequent inspection and maintenance of play area surfaces for ongoing compliance with ASTM F 1951 (*i.e*., for *accessibility*). Furthermore, public entities are required to maintain accessible features, as follows:

> § 35.133 Maintenance of accessible features
>
> (a) A public entity shall maintain in operable working condition those features of facilities and equipment that are required to be readily accessible to and usable by persons with disabilities by the Act or this part.
>
> (b) This section does not prohibit isolated or temporary interruptions in service or access due to maintenance or repairs.[xxxv]

In *Guidance on the 2010 ADA Standards for Accessible Design*, the following notice is given:

> The Department [of Justice] would caution covered entities selecting among the ground surfacing materials that comply with the ASTM requirements that they must anticipate the maintenance costs that will be associated with some of the products. Permitting a surface to deteriorate so that it does not meet the 2010 Standards would be an independent violation of the Department´s ADA regulations.[xxxvi]

Meeting the Challenge data collection personnel have not used either the TRIAX 2000 or Rotational Penetrometer to date. As noted above, we have found that there are a very few instances where our stability evaluation of surfaces falls in the margin between the low end of *moderately stable* and *not stable.* Practically speaking, in these instances we present a finding that the surface does not adhere to the ADA Standards and recommend that owners improve such surfaces where stability is suspect. Relying on the U.S. Access Board's definition of a stable surface as one that "resists change from contaminants or applied force, so that when the contaminant or force is removed, the surface returns to its original condition", in almost every case, quickly demonstrates whether or not a surface is stable. It does not take a laboratory trial or a Rotational Penetrometer to notice that twisting the sole of one's shoe on EWF or pea gravel, with even minimal force, alters the surface, often to a depth of more than one inch, and the surface does not return to its original condition or shape. Additionally, we have not found surfaces where firmness was questionable and stability was not. In our estimation – apparently confirmed by NCA's study – firmness is more consistently accomplished in the real world than stability. However, with regard to fall attenuation, unless we have found obvious deficiencies, we have deferred to the expertise of recreation professionals who have had CPSI training. Having no easily applied method to objectively measure impact attenuating properties limits the ability to provide affirmative evaluation of the safety compliance of play area surfaces.

Conclusions

A number of valuable studies have been conducted that inform our understanding of the use and performance of various materials to provide safety or accessibility, or a combination of safety and accessibility, as required by the ADA for play area surfaces. While a large number of natural and synthetic materials have been subjected to ASTM trials to assess their properties and identify potential compliance with safety and/or accessibility requirements, the fact that a given material has passed a test in the laboratory gives no federal government sanction or certification of the material as "ADA-approved". Reliance of recreation professionals on manufacturers and vendors to provide products and materials that deliver actual real world, on-site safety and accessibility has been ineffective. Training and tools to establish verifiable and repeatable results when evaluating play area surfaces are necessary to ensure that play areas are designed, installed, and maintained to meet or exceed the minimum requirements of the ADA.

Concurrent with ongoing research, Meeting the Challenge and other accessibility consulting firms have taken strides to apply the ADA Standards in the field. While the research is invaluable and the development of means and methods of providing consistent and repeatable metrics is necessary, as of March 15, 2012, the supplemental standards for recreation facilities *are enforceable* and entities with obligations to provide access to the services, programs, and activities associated with those facilities have practical, real-time pressures to assess their facilities. Entities that proactively assess or solicit assistance in assessing their facilities to develop transition plans are not only managing risk wisely but are also taking the steps necessary to providing accessible recreation programs for people with disabilities.

March 15, 2012 was not a deadline it was a starting line. Waiting for researchers, the Access Board, and the Department of Justice to clarify every gray area in the Standards is no longer a viable plan. Some judgments and decisions must be made now. The time when the Department of Justice and or individuals with disabilities will expect to see accessible playgrounds is no longer some distant, future date. The minimum requirements for accessible play areas cannot be met without providing safe and accessible surfaces. An understanding of the real world application of these requirements for safety and accessibility and the types of materials and the proper installation of those materials that are most likely to accomplish compliance is critical today.

Resources:

American Society of Testing and Materials, ASTM International, West Conshohocken, PA, Designation F 1292-04.

American Society of Testing and Materials, ASTM International, West Conshohocken, PA, Designation F 1951-99.

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