



Purpose & Applicability

This Fast Facts guidance sheet is intended to provide a basic overview of playground safety surfacing requirements, typical playground surfacing options, pros and cons of various surfacing types, as well as information on the procurement of playground surfacing, and how to go about hiring qualified installers. Guidelines for safety surfacing apply to all **schools, child care centers, licensed family child care homes, early learning facilities**, and public parks. It does not apply to single family residential use play areas. These guidelines only apply to outdoor play areas, not indoor gyms or soft contained play structures.

Governing Documents Relating to Safety Surfacing for Public Play Areas

Various documents developed by the American Society for Testing and Materials including ASTM F1487, ASTM F2223, ASTM F1951, and ASTM F1292 are considered the governing requirements for safety surfacing around play structures. In addition, The Consumer Product Safety Commission (CPSC) Guidebook for Public Playground Safety also provides guidance and information on standards. Local licensing regulations incorporate safety surfacing requirements, and quality rating systems typically incorporate requirements referenced in the Early Childhood Environmental Rating System (ECERS), which is based on ASTM and CPSC standards for surfacing in play areas.

Are Published Requirements and Guidelines the Law for Child Care and Early Learning Centers?

Rhode Island law currently requires that public schools meet CPSC guidelines for safety - and State funded Pre-K classrooms fall under these requirements. In addition, Rhode Island Child Care Licensing Regulations include requirements for safety surfacing that are based on CPSC and ASTM standards. Rhode island's Quality Rating System, BrightStars, as well as the RI Department of Education Comprehensive Early Childhood Education Standards utilize the Environmental Rating Scales (ERS) as part of their systems. ERS relies on CPSC and ASTM standards in its framework for playground safety. In addition, **there is significant case law where ASTM and CPSC published requirements and guidelines have been use to prove owner/ operator negligence in court cases involving injuries in the playground.** The insurance industry is especially concerned with playground safety and often provides incentives for performing audits and meeting safety guidelines.

Why are Surfacing Guidelines and Standards Important?

Falls to the playground surface are the number one cause of injuries and the number two cause of death in playground related incidents. **Severe injuries and death are typically associated with the inadequate provision of proper safety surfacing around play structures.** While play areas inherently incur some type of risk, it is the playground owner's/ operator's responsibility to ensure that every effort is made to mitigate risk and reduce injury based on published guidelines. CPSC and ASTM guidelines and standards have been developed over the course of two decades based on critical injury statistics and ongoing testing. Ensuring that these nationally proven guidelines and standards are adhered to in your center or school is essential to protecting children from serious injury in the playground space.

What is Considered Safety Surfacing?

Safety Surfacing (otherwise known as Impact Attenuating Surfacing) includes a variety of materials that soften the impact from a fall. Safety surfacing falls into one of two categories; loose fill or unitary products. Typical loose fill selections include, but are not limited to; wood mulch (landscape mulch), engineered wood fiber (EWF) (play mulch), sand, pea stone, and recycled rubber mulch. Examples of unitary products include; poured in place (PIP) rubber, rubber tile, and synthetic turf.

Materials that are **NOT** considered safety surfacing include grass, concrete, asphalt, or other non-impact attenuating surfacing. These surfaces may be utilized in areas where a fall from an elevated height would not typically occur, such as around a play house, picnic table, or in open play areas where children might engage in activities that do not pose a risk of falling from an elevated height such as playing games, riding tricycles, etc.

Where To Use Safety Surfacing

Safety surfacing is required **within the "use zone" of equipment and elements intended for play that are elevated from the ground.** A use zone is defined as the area **under and around** a piece of play equipment onto which a child falling or exiting from the structure would be expected to land. This zone typically extends 72" (6') from the edge of the play structure or component¹.

Safety surfacing needs to be under and around all climbers, component structures, stepping pods, balance beams, and similar elements that are elevated off the ground. The only exemptions to the safety surfacing requirements are for embankment slides, playhouses, play panels, water tables, and other equipment intended for play where the child's feet are in contact with the ground.



Note that according to national standards, safety surfacing **DOES NOT** need to be placed around the following:

- Picnic tables, trash receptacles, benches, or other site features not designated for play².
- Rocks, boulders, logs, or other natural items outside the play area and not intended for play as part of the space³.
- Areas outside the 72" use zone from play elements or structures **except for slide exits** where the use zone may extend up to 96"¹.

While safety surfacing is not required outside the use zones, some facilities elect to extend the safety surfacing to the play area perimeter for maintenance or uniformity purposes. However, keep in mind that it is best practice to incorporate a variety of different surface types to enhance the play experience. While surfacing types such as grass and hard pavement can have important uses for ground type play activities, they should not be used under and around pieces of elevated play equipment.

Footnotes:

1. Use zones can vary for different types of equipment. Please refer to CPSC and ASTM Guidelines and Standards for more information on specific use zone and setback requirements.

2. There is often debate about whether or not site furnishings should meet the same safety surfacing requirements as play structures if they are contained inside the play area or are located nearby. CPSC and ASTM do not apply to any element outside the designated play area. However, good judgment and design should be used when locating site furnishings to minimize hazards. Many hazards can be mitigated through proper site supervision, signage, and management of the play facility.

3. The recent resurgence of natural based play areas has led to many questions surrounding how standards apply to natural elements inside and outside the play zones that may or may not be intended for play. There are no specific standards that apply only to natural based playgrounds, and likewise no specific exemptions. In general, if a natural element in a play area is designed as part of the play experience (i.e. a boulder was placed specifically for climbing) then the same standards for surfacing and use zones would apply. If the natural element is intended for seating, a table, or other type of site furnishing, and is outside the normal play zone, then it would fall outside the requirements by definition. If you are uncertain about whether or not an element should have safety surfacing meeting the standards contact a qualified designer or Certified Playground Safety Inspector.

What to Do Before Selecting a Surface - Plan Before You Act

A very common mistake is to select and install a new safety surface only to find out the equipment the surfacing has been installed under/around needs to be removed due to non-compliance issues or other factors. This can result in a wasted time, money, and resources. The first step in selecting a surface starts with a thorough evaluation of the playground as a whole. You may want to enlist the support of a qualified design professional or certified playground inspector to help you with this evaluation. In addition, you can contact LISC's Rhode Island Child Care and Early Learning Facilities Fund (www.riccelff.org) for a technical assistance visit to obtain a preliminary evaluation of your space.

When evaluating a given outdoor play space you should ask the following questions:

- How old is the play area and related play equipment? Is it due for replacement?
- Can you reasonably repair the equipment to get it to proper CPSC or ASTM compliance, or does it need to be replaced entirely?
- What is the long term plan for the play area? Are you going to replace the play area in the next 2 or 3 years?
- Can you install new play equipment to add to total play value in the near future if necessary?
- Do you anticipate changing the layout of the play area (i.e. expanding or reducing the size, moving equipment, etc.)?
- How can you mitigate the long term/ short term hazards in a reasonable way?

The key is to assess your specific needs and think through your plan of action to avoid common pitfalls. Keep in mind though that planning and inaction are not the same thing. **If safety surfacing is deficient or other hazards exist, it is the owner's/operator's responsibility to resolve these issues quickly.** This may include implementing some short term options in tandem with long term plans.

Surfacing Considerations – General

While safety surfacing as a whole is fairly straight forward, selecting the right one for your needs can sometimes prove difficult. Factors such as durability, accessibility, long term maintenance, use area, and budget all factor into the equation. When evaluating surfacing consider the following:

- What is the relative cost of options and which ones meet your budget range?
- What is the long term durability and maintenance associated with each product?
- Does a particular surfacing meet the critical fall height requirements for your equipment?
- What type(s) of surfacing will accommodate access to critical play zones for children with disabilities (ADA)?
- What type(s) of surfacing fit in with the context of the play area (e.g. natural vs. manufactured playground elements)?

There is no one right answer. However, some options are better than others depending on the characteristics you are seeking. The important thing to remember it to do your research.

Surfacing Considerations - Cost

The number one factor that drives your surfacing selection may be cost. Unitary surfaces are very popular due to their long term durability and reduced maintenance, but the price of these materials is often prohibitive. When considering surfacing options, be honest about your budget and what you can spend both in the short and long term. In addition, think holistically about the playground design and how you may be able to shave costs through proper design. For instance you may consider:

- Clustering certain types of low play equipment in areas to reduce the safety surface depth or utilize a different surfacing altogether (i.e. grass in areas outside of equipment use zones).
- Mixing a variety of surfacing options based on the intended uses and play goals. You may consider poured in place rubber only under access ways and high use areas.

- Providing more ground based activities that provide challenge without the need for safety surfacing. Remember, safety surfacing applies only around elevated play equipment.
- Using grass, regular mulch, or pavement surfacing for open play areas. Safety surfacing is not needed in areas that do not have elevated play equipment. By minimizing the use of manufactured climbers and other elevated equipment you can significantly reduce safety surfacing needs.

Keep in mind that ultimately, the number one goal is safety regardless of which surfacing type you choose. The following chart identifies some key pros and cons of various surfacing types.

SURFACING MATERIAL	PROS	CONS
ORGANIC LOOSE FILL <i>(wood chips, bark mulch, engineered wood fiber)</i>	<ul style="list-style-type: none"> ■ Low cost ■ Easy installation ■ Good drainage 	<ul style="list-style-type: none"> ■ Will compress and need to be monitored for correct depth ■ Can be flammable ■ Requires some type of barrier to contain the material ■ Likely to end up spread around the playground ■ Not ADA approved
SAND	<ul style="list-style-type: none"> ■ Low cost ■ Easy installation 	<ul style="list-style-type: none"> ■ Attractive to bugs and animals ■ Hard to keep contained within fall zone/ needs lots of sweeping and raking ■ Slippery on surfaces outside of fall zone ■ Not ADA approved
PEA STONE	<ul style="list-style-type: none"> ■ Low cost 	<ul style="list-style-type: none"> ■ Often thrown by children/can be dangerous ■ Children may place small stones in ears, nose, etc. ■ Requires ongoing maintenance ■ Not ADA approved
SHREDED RUBBER	<ul style="list-style-type: none"> ■ ADA approved ■ Lower cost than other synthetic materials ■ Easy installation 	<ul style="list-style-type: none"> ■ Will compress and need to be monitored for correct depth ■ Reports of black rubbing off on children's clothes, hands, etc.
SYNTHETIC UNITARY <i>(rubber mats or tiles, pour-in-place surfaces)</i>	<ul style="list-style-type: none"> ■ ADA approved ■ Provides permanent surfacing solution ■ Very low maintenance ■ High level of safety 	<ul style="list-style-type: none"> ■ High cost ■ More complex installation

Surfacing Considerations - Determining Depth of Surfacing

It is important to note that the required depth of the safety surface will vary based on the type of surfacing you decide to use as well as the height of the play equipment. All loose fill surfacing types do not require the same depth in inches to be effective. Safety surfacing is tested from various heights to meet a standard called ASTM F1292. Materials are tested in a laboratory to meet a certain maximum G force requirement (GMAX). The GMAX for safety surfacing is a maximum of 200g's. Using this information, the lab tests various surfacing at different heights to get a critical height, or the height at which a life threatening injury would not be expected to occur. **This data is available through the manufacturers and distributors of safety surfacing.** However you will need to tell your safety surfacing supplier the maximum fall height of your structure or equipment. Fall height is determined by measuring from the highest "designated play surface"¹ to the ground below the piece of equipment.

The designated play surface is typically²:

- The highest platform on a play structure (not the top of guardrails, barrier rails, or posts).
- The highest part of a climbing component and the surface below it.
- The distance between a platform and surface for platform accessed sliding poles.
- The distance between the transition platform and surface for slides.
- The distance between the pivot point and the surface beneath it for swings.

Determining the correct fall height of a play elements is critical to installing the proper type and depth of safety surfacing. **If you are unsure how to determine the correct fall height or depth of surfacing we encourage you to consult with a qualified playground designer, playground equipment distributor, or other technical consultant.** A small investment in a technical consultation can save wasted time and money and more importantly can help significantly minimize the risk of serious injury on your playground.

The following table serves as an example of how surfacing depth requirements vary by type and based on fall height:

Inches	Of	(Loose-Fill Material)	Protects to	Fall Height (feet)
6*		Shredded/recycled rubber		10
9		Sand		4
9		Pea Gravel		5
9		Wood mulch (non-CCA)		7
9		Wood chips		10
* Shredded/recycled rubber loose-fill surfacing does not compress in the same manner as other loose-fill materials. However, care should be taken to maintain a constant depth as displacement may still occur.				

1. A designated play surface is defined as an area greater than 2" X 2" in size with an angle less than 30 degrees. This typically does not include the top of guard rails, barrier rails, or post tops typically found on newer type composite structures.

2. Please refer to ASTM F1487 or the CPSC Guidelines for Public Playground Safety Handbook for more information about calculating fall height for specific playground components.

Purchasing and Installing Safety Surfacing

Safety surfacing varies widely from natural materials to manufactured products. As such, where you purchase the materials and who installs them also varies widely. The list below outlines the typical suppliers of each surface type and offers suggestions on the types of installers that should be used:

Surfacing Type	Typical Sources/ Suppliers	Typical Installer
<p>Engineered Wood Fiber or Recycled Rubber Mulch (Play Mulch)</p> <p><i>EWF is not regular landscape mulch. EWF is hardwood that is shredded to specific dimensions to meet a higher fall height as well as ADA requirements as outlined in ASTM F1951. Rubber mulch is made from recycled tires.</i></p>	<p>Typically purchased through a local playground equipment/ surfacing distributor (see <i>Resource Sheet</i>). Must come with a certificate attesting to compliance with ASTM F1292 for fall height and ASTM F1951 for accessibility.</p>	<p>May be installed by a local landscape contractor or site work contractor. Distributors can often recommend an installer, or even have their own in house people to install the surfacing at an added cost.</p>
<p>Poured in Place Rubber</p> <p><i>PIP rubber is typically a 2 part process that uses a shredded recycled rubber base with a virgin EPDM color topping. All rubber is glued together utilizing a urethane based epoxy. Installation takes special skill to mix and trowel and should only be performed by a manufacturer trained installer.</i></p>	<p>Typically purchased through a local playground equipment/ surfacing distributor (see <i>Resource Sheet</i>). Must come with a certificate attesting to compliance with ASTM F1292 for fall height and ASTM F1951 for accessibility. It's critical you know your specific fall heights since even a small over calculation can cost a lot of extra money for the project.</p>	<p>This surfacing <u>should not</u> be installed by the facility owner, or a local general contractor. Most reputable distributors and their manufacturers require you to use a manufacturer trained installer due to the unique install requirements. Installing surfacing yourself may void the warranty.</p>
<p>Rubber Tiles</p> <p><i>Tiles are comprised of the same components as PIP rubber, but are made to specific tolerances in a factory. As a result, they are typically more apt to meet specific fall heights and last longer. In addition, tiles are easier to install. However gaps sometimes become an issue.</i></p>	<p>Typically purchased through a local playground equipment/ surfacing distributor (see <i>Resource Sheet</i>). Must come with a certificate attesting to compliance with ASTM F1292 for fall height and ASTM F1951 for accessibility. Tiles come in various fall height thicknesses, but are typically laid at a specific depth so there are not a lot of ways to shave cost.</p>	<p>This surfacing can be installed by the facility owner, or a local general contractor, <u>but is not recommended</u>. Most reputable distributors and their manufacturers require you to use their manufacturer trained installers due to the unique install requirements.</p>
<p>Synthetic Turf</p> <p><i>Synthetic turf is relatively new to the play market. The impact attenuation comes from a pad typically installed under the turf carpet. Turf fibers are made of polyethylene and are filled with sand or special type of infill. The downfall of synthetic turf is that it must be cut and seamed a lot around play equipment, which can lead to tears and separation.</i></p>	<p>Typically purchased through a local playground equipment/ surfacing distributor (see <i>Resource Sheet</i>). Must come with a certificate attesting to compliance with ASTM F1292 for fall height and ASTM F1951 for accessibility. The turf should be specifically labeled and marketed for playgrounds, not residential or athletic field markets.</p>	<p>Requires professional installation by a manufacturer trained crew. Most reputable distributors and their manufacturers require you to use their manufacturer trained installers due to the unique install requirements. Most companies offer a cost with the product installed. You are still responsible to prepare the base.</p>

<p><u>Sand and Pea Stone</u></p> <p><i>Traditional sand and pea stone is often used in areas not required to have ADA compliance or are part of a naturalistic playground. Sand is also still used for many open play areas. You can find recommended depths for specific fall heights in the CPSC Handbook and online resources.</i></p>	<p>May be purchased through a local landscape supplier or installer. Ensure you do some research on the proper depth to meet a specific fall height. You should find documentation from certified testing labs that verify fall heights for your records. Typically the higher the equipment, the more sand or pea stone you will need.</p>	<p>May be installed by a local landscape contractor or site work contractor. Refer to the CPSC Handbook for installation recommendations. Typically requires a well drained base and a soil separator fabric. A firm edge is also typically required to prevent migration.</p>
<p><u>Landscape Mulch and Other Loose Fill Products</u></p> <p><i>Landscape mulch such as pine bark or cedar may be used as a safety surface. However, long term maintenance and non-compliance with accessibility regulations usually lead owners/operators to avoid this surfacing. This is a good choice for incorporation into natural playgrounds.</i></p>	<p>May be purchased through a local landscape supplier or installer. Ensure you do some research on the proper depth to meet a specific fall height. You should find documentation from certified testing labs that verify fall heights for your records. Typically the higher the equipment, the more mulch you will need. Works well with natural playgrounds and planting beds.</p>	<p>May be installed by a local landscape contractor or site work contractor. Refer to the CPSC Handbook for installation recommendations. May require a soil separator fabric. Edging is not always required and can integrate well with common planting areas.</p>

It is important to note that most manufactured surfacing should be installed only by professionally trained staff, failure to do so could result in a poor installation or voiding of product warranties. Surfacing distributors will often have installers that they recommend or require. Refer to the Resources section for a list of local play equipment and surfacing distributors that serve the RI area.

When opting for loose fill materials you will also want to factor in the way you will “contain” these materials. For example, landscape timbers are often used to contain areas of landscape mulch and prevent it from spreading around to other spaces thus quickly reducing its overall depth. Be careful to not inadvertently create tripping hazards when doing this. Utilizing a qualified playground designer for your space will help you to ensure that all of these variables are considered.

Selecting a Surfacing Contractor

If you are installing manufactured surfacing (i.e. PIP, tiles, etc.) it's often best to defer to the manufacturer or distributor trained installation crew. You will have the comfort of knowing the crews are familiar with the work, and manufacturers and distributors will stand by their installation contractor.

If you decide to install a natural surfacing, or need to prepare the base for a manufactured product installation, a local landscape or site work contractor may be used. However, you should:

- Seek out referrals from people you know who have had similar installations.
- Stick to specialized playground installers when possible. General contractors, landscapers, and other tradesman are typically not as fluent in the many standards and products available in the industry.

- Do a little research into how long the company has been around, number of installations, and check out some of their recent installations.
- Check out the Rhode Island Contactor's Registration and Licensing Board website at <http://www.crb.state.ri.us/search.php>. Registration as a licensed contractor ensures that the installer has insurance and meets minimal standards, **but does guarantee they are qualified or competent** so still do your research.
- Ask a local playground distributor, designer, or qualified playground professional, for a referral to a local contractor.

What to Do Once you Locate a Contractor

Once you locate one or more competent installers we recommend the following:

- **Provide the contractor with this document and ensure they understand all the specific key requirements prior to having them provide you with an estimate.**
- Review the project with them and lay out the perimeter of the play surfacing so you are both clear on the extents of the surfacing limits and finish details.
- Review any special preparation requirements such as the installation of edging, gravel, filter fabric, or pavement.
- Review all estimates and work descriptions carefully, ensuring that all key requirements will be met.
- Review installation procedures and ensure all materials meet the provided standards and are installed correctly.
- Consult with a qualified designer or certified playground inspector if you don't feel comfortable overseeing the project or inspecting the final product.
- **Do not pay your contractor until you, or your designer/ technical advisor, has visually inspected the installation and verified that it meets all requirements.** Failure to inspect the final product could cost you more funds in the future to correct deficiencies.
- Obtain a copy of compliance with ASTM F1292 and ASTM 1951 for all manufactured surfacing for placement in your files.

On-Going Maintenance

Keep in mind that loose-fill surfacing materials may have a lower initial cost to purchase and install, but, tend to have higher on-going maintenance needs. In high-use areas, loose materials may need to be raked daily or tilled (fluffed) periodically to loosen compaction and replace materials that have been pushed away. Loads of loose materials may need to be trucked in on an annual or semi-annual basis to keep the surface at an appropriate depth. Loose-fill materials should also be regularly checked for protruding or sharp objects such as glass, can tops, sharp rocks and metal.

Unitary, synthetic materials such as poured-in-place and rubber mats also have maintenance needs. Repairs may be needed to gouges, burns and loose areas. Synthetic material may also need to be swept frequently to prevent sand, dirt, rocks or other loose materials from becoming a slipping hazard.

Finally, keep in mind that all surfacing material should provide good drainage. Drainage problems can create issues with any surfacing type. Loose fill materials, particularly mulch, may freeze in the winter months. This problem will be worse in areas where water pools and does not drain. If loose fill surfacing becomes frozen it is no longer usable as a safety surface. Elevated equipment above frozen loose fill surfacing should not be used until freezing resolves and the loose fill materials can be checked for appropriate depth.

Resources

If you have difficulty understanding surfacing requirements, or you need further assistance, we highly recommend speaking with a professional designer specializing in playgrounds or a certified playground safety inspector. They can often provide an independent voice relating to a variety of play area related topics.

If you need more information about various manufactured surfacing options, or need assistance selecting the right option, you may want to contact a surfacing vendor/distributor directly. The following is a partial listing of play equipment and surfacing vendors serving Rhode Island. All of the vendors listed have local sales people dedicated to the RI market that can perform an on-site advisory visit.

Distributor/ Supplier	Phone/ Website/ Email	Comments
O'Brien and Sons, Inc.	508-359-4200 www.obrienandsons.com mail@obrienandsons.com	Vendor for various play structures and surfacing including PIP, tiles, synthetic turf, and play mulch.
JP LaRue, Inc.	1-800-986-3716 www.jplarue.com info@jplarue.com	Vendor for various equipment and surfacing options. Includes tiles and play mulch.
MRC	1-800-922-0070 www.mrcrec.com mrc@gametime.com	Very large distributor focused on Playcore products including various safety surfacing options.
Ultiplay Parks and Playgrounds	1-508-634-1497 www.ultiplayus.com mparody@ultiplayus.com	Vendor for synthetic turf, PIP, play mulch and other types of surfacing.

Note that this list is not comprehensive and neither LISC nor the RICCELFF endorse or have qualified any of the identified suppliers. This list is being provided for the convenience of owner/operators in locating surfacing for their play facilities.

To locate a Certified Playground Safety Inspector in your area, visit the National Recreation and Parks Association CPSI registry, at https://www.nrpa.org/CPSI_registry/default.aspx

Other Resources Include:

- The RICCELFF technical advisory service for Rhode Island child care and early learning centers. This service includes a brief evaluation of play facilities, identification of major safety issues, advice on repairs/ renovations, and a discussion of goals and outcomes. To apply for a TA visit go to <https://riccelff.org/our-services/technical-assistance/>
- The CPSC Handbook for Public Playground Safety, Publication No. 35, available at <http://www.cpsc.gov/PageFiles/122149/325.pdf>. A great resource for surfacing information including typical fall heights for certain types of natural surfacing.
- Information regarding safety surfacing options as they relate to accessibility <http://www.access-board.gov/guidelines-and-standards/recreation-facilities/guides/surfacing-the-accessible-playground>
- RICCELFF online resources and fast fact sheets including how to select a contractor and design professionals. Go to <https://riccelff.org/resources/>

Referenced Documents

ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

ASTM F1292 - Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment

ASTM F1951 - Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

ASTM F2373 - Consumer Safety Performance Specification for Public Use Play Equipment for Children 6 Months through 23 Months

ECERS - Playground Information to Use with the Environmental Rating Scales

CPSC (Consumer Product Safety Commission) handbook for Public Playground Safety, Publication No. 325.