

Playground Protective Surfacing



NRPA's: *The Daily Dozen*

1. Improper Protective Surfacing
(79% of playground injuries result from falls)
2. Inadequate Use Zones (minimum of 72")
3. Protrusion & Entanglement Hazards (ex. bolt ends, structural extensions, "S" hooks, gaps at top of slides)
4. Entrapment in Openings (between 3½" & 9")

Playground Protective Surfacing

From F2223 Standard Guide
ASTM Standards on
Playground Surfacing . . .



IMPACT ATTENUATION – The ability of a surface to reduce and dissipate the energy of a falling body.

SURFACE SYSTEM – All materials that contribute to the impact absorption of force to minimize the likelihood of a life-threatening head injury under or around a piece of play equipment.

Playground Protective Surfacing

- Loose Fill (organic or inorganic, ex. engineered wood fiber, wood chips, sand, pea stone, shredded rubber)
- Unitary (ex. Tile, poured-in-place, or bonded rubber surface)



Selecting Protective Surfacing

Issues to Consider:

- Fall Height of Equipment
- Critical Height of Surfacing
- Cost - Initial vs. Long Term
- Frequency of Use
- Maintenance
- Environmental Conditions
- Method of Containment
- Accessibility



Advantages of Loose-Fill Surfacing Materials

- Low initial cost
- Ease of installation
- Good resiliency, if sufficient depth
- Some materials are . . .
Accessible, durable, quick draining, quick drying, readily available, non-tracking, non-soiling, not susceptible to vandalism, non-flammable



Disadvantages of Loose-Fill Surfacing Materials

The following conditions may reduce cushioning potential and cause other problems:

- Rainy weather, high humidity, freezing temperatures
- With normal use over time, combines with dirt and other foreign materials
- Depth may be reduced by displacement due children's activities and may be blown by the wind
- Over time, may decompose, be pulverized, and compact requiring replenishment



Disadvantages of Loose-Fill Surfacing Materials

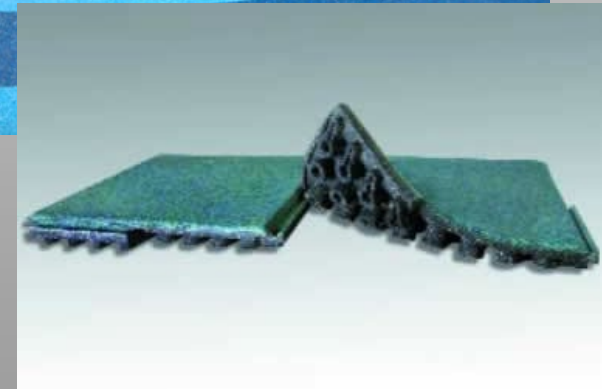
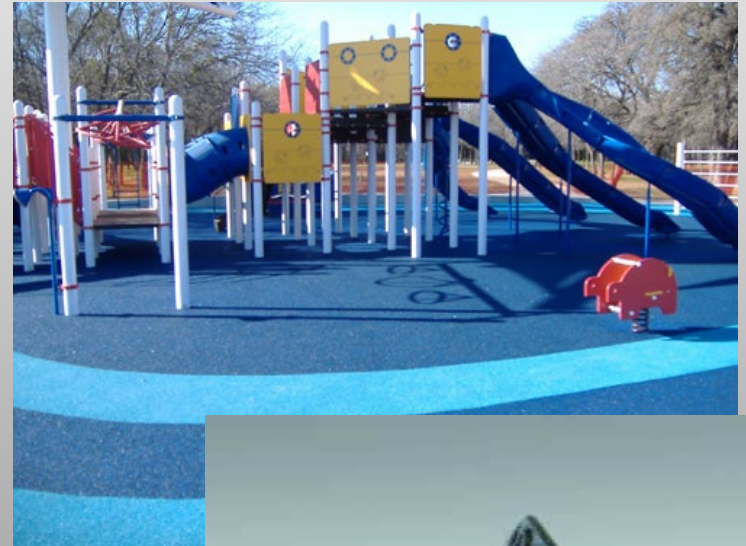
The following conditions may reduce cushioning potential and cause other problems:

- Spreads easily outside of containment area
- Can be blown or thrown into children's eyes
- Be a soiling or tracking problem
- Provide a home to vermin



Advantages of Unitary Surfacing Materials

- Wheelchair accessible
- Low maintenance
- Easy to clean
- Consistent shock absorbency
- Material not displaced by children during play activities
- Generally low life-cycle costs
- Generally no method of containment needed



Disadvantages of Unitary Surfacing Materials

- Relatively high initial cost
- Most often used on almost level, uniform surfaces
- High repair costs
- Subject to vandalism
- May be flammable
- Full rubber tiles may curl up and cause tripping
- Some designs susceptible to frost damage

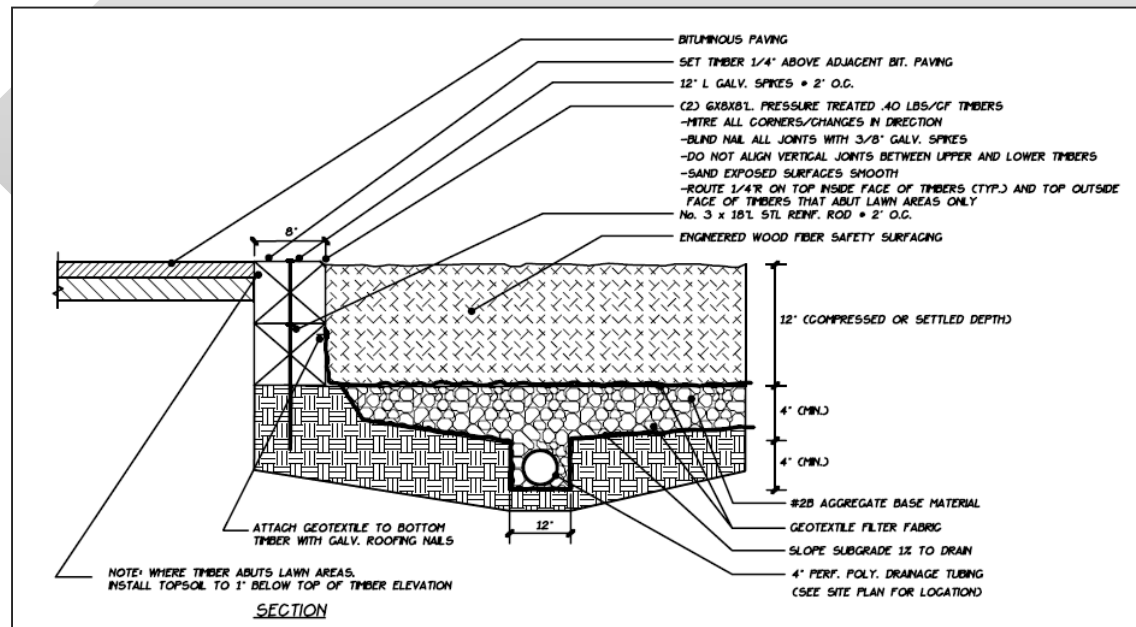


CPSC: Critical Heights of Tested Materials

Table 2. Minimum compressed loose-fill surfacing depths

Inches	Of	(Loose-Fill Material)	Protects to	Fall Height (feet)
9		Shredded/recycled rubber		10
9		Sand		4
9		Pea Gravel		5
9		Wood mulch (non-CCA)		7
9		Wood chips		10

Installation of Protective Surfacing Should Include:



- Drainage System (to manufacturer's specs)
- Geotextile Fabric (below & above stone)
- Crushed Stone (clean 2B)
- Containment (non-toxic treatment)

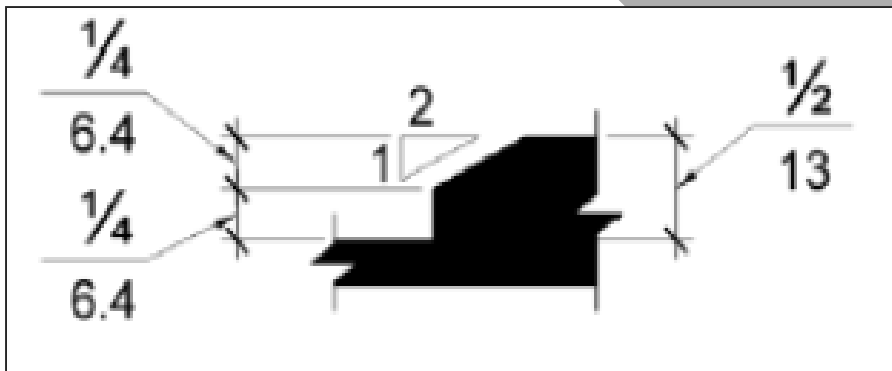
Accessibility

- Protective surfacing to be manufactured and maintained “*Firm and Stable*” in areas meant to be accessible
- No gaps bigger than 1/2” diameter



Accessibility

- Abrupt changes in level must be $\frac{1}{4}$ " maximum, changes in level larger than $\frac{1}{2}$ " must be ramped.



Protective Surfacing Maintenance: Loose-Fill

- Rake in low areas (keep level, maintain thickness of depth)
- Sweep from hard surface walkways
- Remove all foreign material (trash, tree branches, etc.)
- Remove weeds, or periodic application of an approved weed inhibitor (suitable for human contact)



Protective Surfacing Maintenance: Loose-Fill

- Sand and gravel require frequent raking and turning to avoid compaction and developing hardpan (hard layer resembling concrete)
- Check level of surfacing against required depth (markings on play structure supports and/or containment barrier)



Protective Surfacing Maintenance: Loose-Fill

If insects are present . . .

- Check the surrounding area for possible infestation.
- Contact a pest management specialist
- Or try a natural repellent such as a mixture of vinegar, mild detergent and water which can be applied with a common pump sprayer to the surface. (Suggested mixing ratio – 50/50 water and vinegar plus a cup of detergent.)



Protective Surfacing Maintenance: Loose-Fill

Check performance of drainage system . . .

- Inspect water flow from drainage system outflow pipe immediately after rain (no standing water on playground surface)
- Or dig down to the base of the surfacing to check for standing water. (The water level should be below the base of the loose-fill surfacing within 30 minutes after the rain ceases.)



Protective Surfacing Maintenance: Engineered Wood Fiber (EWF)

- Do not mix brands of any manufactured loose-fill products.
- Top off, don't turn over.
- During a dry season, it may be necessary to wet the surface of the EWF with water to resist flammability or apply a fire retardant (designed to be used on fresh wood and is safe for human contact)



Protective Surfacing Maintenance: Engineered Wood Fiber (EWF)

Fungus, molds, and mushrooms

- Short-term solution is to scoop out and dispose of the fungus. (Then, if desired, a mixture of one part liquid laundry detergent to three parts water can be poured or sprayed on the surface to kill the bacteria the fungus is feeding on.)
- If the fungus persists, granulated or powdered lime (limestone) can be spread over the area. Lightly rake the surface.



Protective Surfacing Maintenance: Shredded Rubber

- Remove any foreign objects such as glass, rocks, and litter.
- Rake in low areas.
- Top off as necessary to maintain proper depth and warranty.



Protective Surfacing Maintenance: Wear mats

Install to manufacturer's specifications.
Typically used in loose-fill surfacing in
high-impact areas
(swings, slides, merry-go-rounds, etc.)

- No edges above surfacing (tapered edges recommended)
- Keep transition between wear mats and loose-fill level (ADA, trip hazard)
- Periodically turn over mat & add surfacing, as needed, to maintain depth; re-secure mat per manufacturer's installation instructions.



Protective Surfacing Maintenance: Wear mats

- Visually inspect for holes & tears (trip hazards), cracks, & general wear; exposed anchors or exposed cables
- Immediately cut and remove any exposed cable
- If the mat contains any hazards, remove the mat and replace with a new mat
- Drive any exposed anchors below the base of the loose-fill surfacing or snip duckbill cables at subsoil base, so they do not become exposed



Protective Surfacing Maintenance: Poured-in-Place



- Check for depressions, ruts, and worn areas, paying particular attention to high-impact areas
- Remove all foreign material (trash, tree branches, etc.); use a vacuum or blower to remove fine particles, or hose off (if pressure washer at a setting not to exceed 1500 psi, spray nozzle no closer than 12" to the surface)
- Snow may be removed with a shovel. Do not use a snow blower on the surface. Salt or Calcium Chloride is not recommended.

Protective Surfacing Maintenance: Poured-in-Place

General area cleaning . . .

- Apply a mixture of full strength mild household or commercial detergent and water, using a garden pump sprayer, to a damp area approximately 4' by 4'. Scrub using a bassine (coarse leaf fiber) 10" medium bristle scrub brush.
- Repeat process until entire surface has been thoroughly cleansed. Rinse thoroughly using a garden hose and spray nozzle.
- Perform cleaning during early morning or late afternoon (cleaner will have time to react without evaporating)



Protective Surfacing Maintenance: Poured-in-Place

- Spills/stains – request a recommendation from manufacturer on cleaning products agents, or techniques
- Repairs/preventative maintenance – roll coating/re-sealing, surface patching, re-topping, etc. (correcting/preventing unevenness or fissures from cracking, holes, torn out areas); Repair Kits available from manufacturer
- Re-topping – ensure proper height above finished grade is maintained (heights of transfer points, stairs, slide exits, merry-go-rounds, etc.)



Protective Surfacing Maintenance: Interlocking Tile

Routine Maintenance . . .

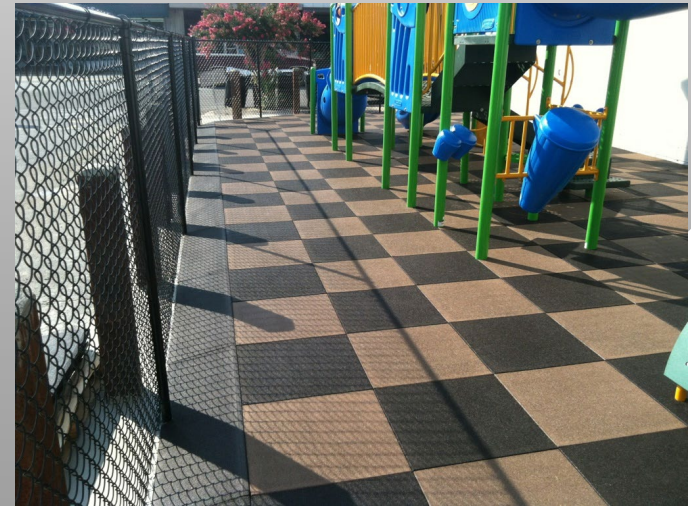
- Remove all foreign material (trash, tree branches, etc.)
 - use a leaf blower or broom to remove fine particles from surface and seams of connecting tile
- Vacuum: periodic vacuuming is recommended in areas where sand is frequently tracked onto the surface.
- Water hose: use a water hose with a pressure spray tip to remove contaminants from porous top surface.



Protective Surfacing Maintenance: Interlocking Tile

Routine Maintenance . . .

- Cleaning agents: Interlocking tile can typically accommodate moderate use of most household or bio-degradable detergent that contain both odor suppressants and disinfectants.



Dilute the cleaning agent as recommended by the manufacturer.

Protective Surfacing Maintenance: Interlocking Tile

Advanced Maintenance:

Depending on frequency of use, tile will occasionally need a deeper clean to remove accumulated dirt and stains.

- Steam vacuum: a steam vacuum with or without cleaning agents is ideal for advanced cleaning and maintenance.
- Power washing: in areas that can accommodate power washing, use a power washer with a wand tip.



Tip: Cut out and replace an interlocking tile when its surface has worn down 1/4" or after 10 years of life.

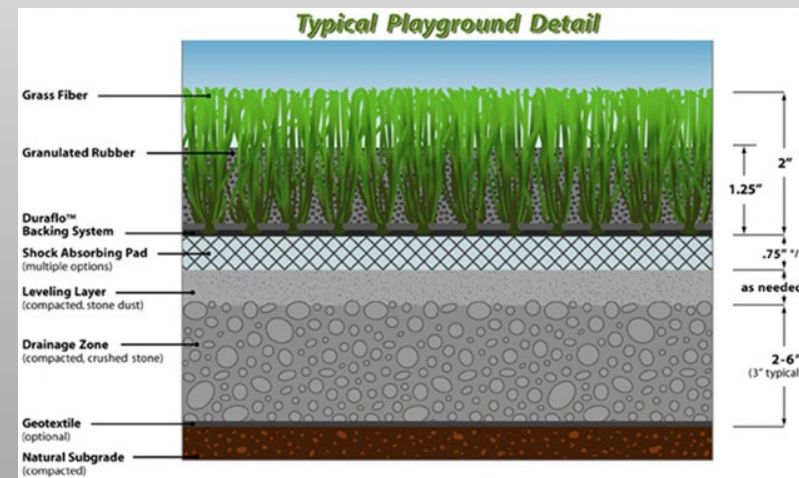
Protective Surfacing Maintenance: Artificial Turf

- Keep surface clean by blowing, sweeping, or hosing off loose dirt and foreign material.
- Use a stiff broom to brush fibers to keep fibers upright and infill from compacting. Keeping fibers upright will extend the life of the turf. Sweeping the infill layer will keep the infill from compacting, which could affect the resiliency of the surface.
- Add infill as necessary, paying close attention to high-use areas such as swings and slides.



Protective Surfacing Maintenance: Artificial Turf

- If spills occur, blot with a clean towel and clean area with mild detergent, followed by flushing area with clean water. If turf contains infill, use a vacuum to suck the infill out of the area before cleaning. Replace infill as needed.
- If turf area is used for pets, there are infill products that absorb urine odor. Ask your turf manufacturer for availability.



Protective Surfacing Maintenance: Artificial Turf

- Inspect seams for separation as well as around the border of the play area to ensure that the turf remains properly anchored.
- Fix rips in artificial turf using seam tape and adhesive; holes and gaps can be patched using a new piece of artificial turf cut to fit the hole and then secured with seam tape and adhesive.
- Perform other maintenance required by your turf manufacturer, ask for a maintenance document from the supplier/installer.



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Question & Answers

