

Protective Ground Surfacing

Protective ground surfacing is one of the most important factors in reducing severity of injuries due to falls. The surface under play equipment with an elevated play surface (e.g. slide, climbing wall) must be both soft and thick enough to absorb the shock of falls.

Hard surfacing materials such as concrete, gravel, sod or hard packed dirt surfaces are unsuitable for use under some play equipment due to their poor shock absorbing properties. Loose-fill surfacing materials, organic or inorganic, have acceptable shock absorbing properties when installed and maintained at a sufficient depth.

In general, loose-fill surfacing materials:

- Require replacement and continuous maintenance (raking and grading) to maintain depth and to remove foreign matter, which can cause injury.
- Contribute to dramatic play because children can manipulate the material.
- Can conceal animal excrement and sharp objects which pose health and injury risks.
- Should never be installed over existing hard surfaces.

Comparison of loose-fill ground surfacing materials		
	Organic Loose Material	Inorganic Loose Material
Material	Pine bark, shredded bark nuggets, wood chips, cocoa shell mulch	Sand, pea gravel, shredded rubber
Advantages	<ul style="list-style-type: none"> ▪ Low initial cost ▪ Ease of installation ▪ Less abrasive than sand ▪ Good drainage 	<ul style="list-style-type: none"> ▪ Ease of installation ▪ Does not promote microbial growth ▪ Generally nonflammable (except rubber products)
Issues to Consider	<ul style="list-style-type: none"> ▪ With time, these materials may decompose and lose their cushioning effect ▪ Material can be displaced by strong winds or the playing action of children thereby reducing the cushioning effect ▪ Susceptible to burning ▪ Subject to microbial growth when wet ▪ Can get thrown around ▪ Some children are allergic to bark dust 	<ul style="list-style-type: none"> ▪ Initial cost varies (transport can be costly) ▪ Sand and pea gravel may be displaced by the playing action of children thereby reducing the cushioning effect ▪ Can be swallowed, blown, or thrown - potentially leading to injury ▪ Easily spreads outside the containment area ▪ Rubber may have an unpleasant smell

Recommended Ground Surfacing under Play Equipment

Playground safety specialists use the chart on the reverse page to recommend heights of play equipment in relation to type of surfacing material at a depth of 9 inches.

Fall Height in Feet from Which A Life Threatening Head Injury Would Not be Expected

Surfacing Material (at a depth of 9 inches compressed)	Fall Height (in feet)
Double Shredded Bark Mulch	7
Wood Chips	10
Fine Sand	5
Fine (pea) Gravel	5

(Consumer Product Safety Commission, 1997)

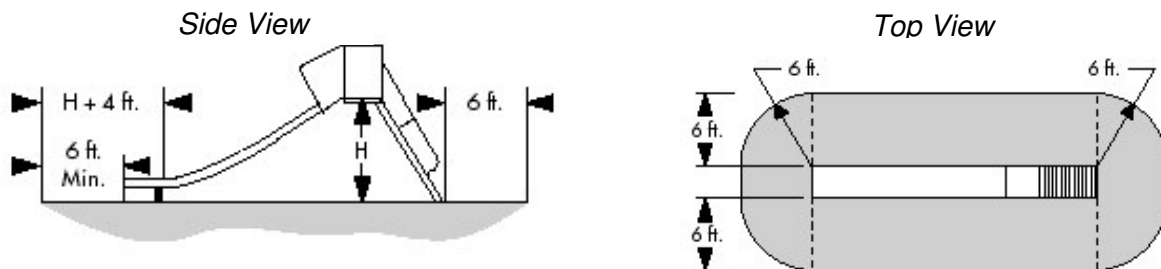
Use Zones

The space surrounding a piece of play equipment can contribute to injury should a child fall or jump from play equipment at an elevated height. A use zone, an extension of protective ground surfacing from beneath play equipment (i.e. swings, slides, climbing play structures) protects children in the area directly surrounding the equipment.

Recommended use zones for play equipment

Equipment	Use Zone
Stationary equipment	Six feet on all sides of the equipment
Slides	Six feet on all sides, four feet plus the height of slide in front of slide chute (see example below)
Swings	Six feet on each side, twice the height of the swing beam in front and back of swing

(Consumer Product Safety Commission, 1997)



■ Denotes Use Zone with Protective Surfacing

Some content of this publication was adapted from the Consumer Product Safety Commission, <http://www.cpsc.gov/> and "Play for All", MIG Communications, 1992.

Visit <http://research.marshfieldclinic.org/children/> or call 1-800-662-6900.

April 2005