Keeping Playgrounds Safe and Reducing Liability Exposures

By Dan Davenport and Phil Wentz

AGENDA

- Risk Management Basics
- Playground Design
- Playgrounds Hazards
- What to do after an accident
- Questions

RISK MANAGEMENT BASICS

- Pre-Loss vs. Post-Loss model
- Regular Inspections, documented
- 3 E's of Safety
- Consumer Products Safety Commission (CPSC), ASTM
- Reasonable forseeability
- Reasonable and prudent person test

4 key points to Playground Design

1. Engineer in Safety
2. Requires Low Supervision
3. High Play Value
4. Low Maintenance

1. Engineer in Safety

- Safety Surfacing
- Layout of Equipment
- Multiple access' and multiple exits
- Reduction of motion toys
  - Swings?
- Be careful of testing new equipment
  - Unintended uses

2. Requires Low Supervision

- Line of sight
- Grouping of activities

3. Low Maintenance

- Reduction of motion toys
- Wear points
- Cables vs. chains
- Disc Challenge

4. Play Value

- Increase activity
- Reduce perch points

Playground Hazards

1. Crush and Shearing Points
2. Entanglement and Impalement
3. Entrapment
4. Suspended Hazards
5. Sharp Points, Corners and Edges points
6. Tripping Hazards

1. Crush and Shearing Points

- Anything that could crush or shear limbs should not be accessible to children on a playground. Crush and shear points can be caused by parts moving relative to each other or to a fixed part during a normal use cycle, such as a seesaw.
- To determine if there is a possible crush or shear point, consider: The likelihood a child could get a body part inside the point, and the closing force around the point.

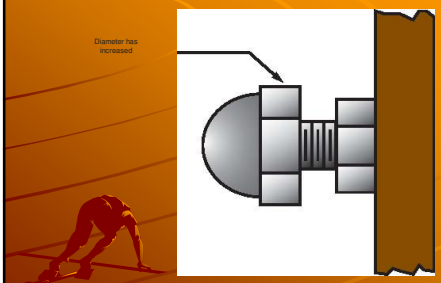


Figure 2. Example of a hazardous protrusion that increases in diameter from plane of initial surface and forms an entanglement hazard and may also be an impalement hazard.

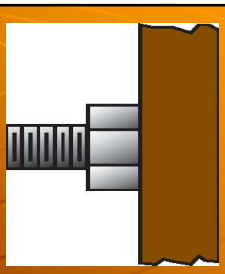


Figure 3. Example of a hazardous protrusion that extends more than 2 threads beyond the nut and forms an impalement/laceration hazard and may also be an entanglement hazard.

2. Entanglement and Impalement

Projections on playground equipment should not be able to entangle children's clothing nor should they be large enough to impale. To avoid this risk: The diameter of a projection should not increase in the direction away from the surrounding surface toward the exposed end. Bolts should not expose more than two threads beyond the end of the nut. All hooks, such as S-hooks and C-hooks, should be closed. A hook is considered closed if there is no gap or space greater than 0.04 inches, about the thickness of a dime.

Any connecting device containing an in-fill that completely fills the interior space preventing entry of clothing items into the interior of the device is exempt from this requirement.

Drawstrings on the hoods of jackets, sweatshirts, and other upper body clothing can become entangled in playground equipment, and can cause death by strangulation. To avoid this risk:

Remove any ropes, dog leashes, or similar objects that have been attached to playground equipment. Children can become entangled in them and strangle to death.

Avoid equipment with ropes that are not secured at both ends.

Children have died when drawstrings on their clothing caught on slides or other playground equipment. Remove hood and neck drawstrings from children's clothing before children play on a playground. Remove scarves and mittens connected through the sleeves.

3. Entrapment

- Head entrapment is a serious concern on playgrounds, since it could lead to strangulation and death. A child's head may become entrapped if the child enters an opening either feet first or head first. Head entrapment by head-first entry generally occurs when children place their heads through an opening in one orientation, turn their heads to a different orientation, then are unable to get themselves out.
- Head entrapment by feet first entry involves children who generally sit or lie down and slide their feet into an opening that is large enough to permit their bodies to go through but is not large enough to permit their heads to go through. A part or a group of parts should not form openings that could trap a child's head.

3. Entrapment

- Also, children should not wear their bicycle helmets while on playground equipment. There have been recent head entrapment incidents in which children wearing their bicycle helmets became entrapped in spaces that would not normally be considered a head entrapment.
- Certain openings could present an entrapment hazard if the distance between any interior opposing surfaces is greater than 3.5 inches and less than 9 inches. When one dimension of an opening is within this range, all dimensions of the opening should be considered together to evaluate the possibility of entrapment. Even openings that are low enough for children's feet to touch the ground can present a risk of strangulation for an entrapped child. Younger children may not have the necessary intellectual ability or motor skills to reverse the process that caused their heads to become trapped, especially if they become scared or panicked.

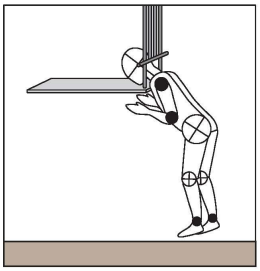
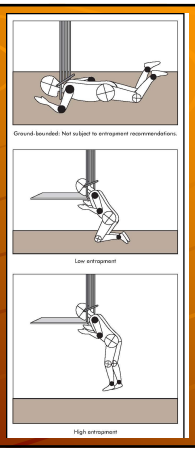


Figure 4. Examples of entrapment below a barrier and between the vertical bars of a barrier.



4. Suspended Hazards

- Children using a playground may be injured if they run into suspended components (such as cables, wires, ropes, or other flexible parts) hanging from one piece of the playground equipment to another or to the ground. Cables, wires, ropes, or similar flexible parts suspended between play units or from the ground to a play unit that are within 45 degrees of horizontal are considered suspended hazards. Recommendations for avoiding these hazards are:
  - Suspended components should not be located in high traffic areas.
  - Suspended components should either be brightly colored or contrast with surrounding equipment for added visibility.
  - Except for swings, any rope, cable, or chain longer than 7 inches should be fastened at both ends and should not be able to be looped back on itself to create a circle with a 5 inch or greater perimeter.
- These recommendations do not apply if the suspended component is more than 7 feet above the protective surfacing and is a minimum of one inch at its widest cross-section dimension.

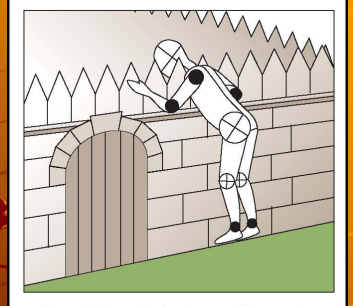


Figure 5. Example of entrapment in an angle less than 55 degrees on a fort.

5. Sharp Points, Corners and Edges points

Sharp points, corners, or edges on any part of the playground or playground equipment may cut or puncture a child's skin. Sharp edges can cause serious lacerations if protective measures are not taken. To avoid the risk of injury from sharp points, corners and edges:

- Exposed open ends of all tubing not resting on the ground or otherwise covered should be covered by caps or plugs that cannot be removed without the use of tools.
- Wood parts should be smooth and free from splinters.
- All corners, metal and wood, should be rounded.
- All metal edges should be rolled or have rounded capping.
- There should be no sharp edges on slides.
- Pay special attention to metal edges of slides along the sides and at the exit

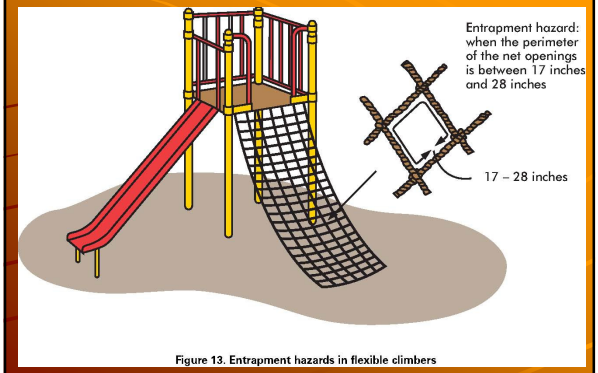


Figure 13. Entrapment hazards in flexible climbers

6. Tripping Hazards

Play areas should be free of tripping hazards (i.e., sudden change in elevations) to children who are using a playground.

The two most common trip hazards are anchoring devices for playground equipment and containment walls for loose-fill surfacing materials.

All anchoring devices for playground equipment, such as concrete footings or horizontal bars at the bottom of flexible climbers, should be installed below ground level and beneath the base of the protective surfacing material. This will also prevent children from sustaining additional injuries from impact if they fall on exposed footings.

Contrasting the color of the surfacing with the equipment color can contribute to better visibility.

Surfacing containment walls should be highly visible.

Any change of elevation should be obvious.

Contrasting the color of the containment barrier with the surfacing color can contribute to better visibility.

Keys issues for Schools

- Safety Surfacing
- Design (to reduce hazards)
- Supervision
- Comply with CPSC, ASTM

What to do after an accident happens?

- Preserve accident scene until investigation is complete
- Remove hazard, if necessary
- Get witness' names and phone numbers
- Recreational Immunity???

Questions?

- Dan Davenport, 503-591-4448
daniel_davenport@beavton.k12.or.us
- Phil Wentz, 503-431-4017
pwentz@ttsd.k12.or.us