

# Public Playground Safety Manual



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## Forward

In 1988, MSBA (Manitoba School Boards Association) published a safety booklet entitled *Playground Safety Manual*. It was created for the use of school maintenance personnel and educators entrusted with designing playgrounds and supervising children at play.

The Canadian Standards Association (CSA) has developed a nationally recognized standard on children's play spaces and equipment; first published in 1990 and updated periodically (1998, 2003, 2007, 2014). All School Divisions are encouraged to obtain their own copy of the current CSA manual.

These standards are voluntary and are not law HOWEVER, courts still use them as precedent. Courts will apply a standard to determine whether reasonable care has been taken by the occupier. In Canada, the *Canadian Standards Association (CSA) Manual on Children's Playspaces and Equipment* will be applied as a test to determine whether reasonable care has been taken to provide for the safety of those using the playground equipment.

The detailed requirements certainly have their place but many individuals', groups and schools have requested simple, workable guidelines and practices to help identify problem areas and provide and maintain safer playgrounds. The MSBA manual is designed to provide simple, workable guidelines and practices to be used 'in the field'. Throughout this manual, you will see diagrams which include further clauses associated with them. Please refer to the current CSA Manual for reference.

We hear frequently that many workplaces spend in proportion a few weeks each year in maintaining and inspecting playgrounds in relation to a variety of other unrelated tasks. It is with these workers in mind, that this publication has been issued so that maximum safety benefits can be realized.

Compliance with this standard will not prevent all injuries as there is still a shared responsibility that must exist among owner/ operator. This compliance is a foundation for safety. Supervision plays a vital role in keeping children safe, as well as proper maintenance and protective surfacing.

Disclaimer: This document has taken the CSA guidelines for Playground Safety and condensed it as a helpful compliment when reviewing the guidelines. It does not replace the CSA guideline and CSA must be used a reference for all playground safety concerns and standards. MSBA Risk Management should not be held responsible.



## **Introduction**

This information guide provides guidelines for public playground equipment and looks at the safety of each piece of play equipment and the layout as a whole. It is important to see this information as a guideline and not mandatory requirements and there may be other methods that can be used to contribute to playground safety. We do believe that following the recommendations in this publication will help minimize playground injuries.

### **Canadian Situation – An Update**

The most recent data available, presented by the Canadian Institute of Health Information (2016), indicates that 1,841 children in Canada in 2014-15 under the age of 18 required hospitalization as a result of a playground injury. Falls were the leading cause of children's injury hospitalizations (44% of all admissions) and 7% of these injuries occurred on playgrounds. An analysis of playground falls between 1994 and 2003 estimated that each year 2,500 children below 14 years of age were hospitalized for serious injuries. Of this total, 81% had suffered a fracture while 14% were admitted for a head injury and 5% suffered from other types of injuries including dislocations and open wounds.



### **American Statistics – A Comparison**

In the United States there were an estimated 238,121 playground equipment injuries in 2014. During the 10 year period from 1996-2005 there were 2,136,800 playground equipment injuries resulting in emergency department visits for children under 18 years of age, an average of 213,700 per year. This 2009 investigation reported a rate of 266 injuries per 100,000 children and no significant change in injuries over these 10 years. Falling from playground equipment was the most common cause of injury and accounted for three quarters of all injuries. Fractures were the most common playground injury (35%) followed by contusions/abrasions (20%) and lacerations (20%). Approximately, 45% of all injuries were to the upper extremities and 15% affected the head.

**The ratio based on population between Canada and the USA is very similar.**



## What is an Accident?

- A happening that is not expected, foreseen or intended,
- An unpleasant and unintended happening sometimes resulting from negligence that results in injury, loss and/or damage.

## Hazard versus Danger

### Danger

Situation that potentially exposes individual to harm, but is visible. ie. jump from a height.

### Hazard

Situation where danger may not be readily apparent, such as entrapment hazards on a piece of playground equipment.

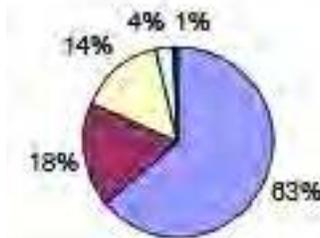
## Where do Injuries Occur on Playgrounds?

It has been suggested that as many as 70% of the injuries from playground equipment are caused by falls from the playstructures.

The Ontario School Boards conducted a ten year study of incurred claims on playgrounds. These claims resulted from injuries sustained mainly from climbers, swings and slides. Climbers alone are involved in about 2/3 of all injuries.

### The injury breakdown is as follows:

Climbers	63.6%
Slides	18.2%
Swings	14.2%
Teeter-totters	3.5%
Merry-go-rounds	0.5%



**Analysis of playground injuries indicates injuries could have been prevented or inspections and maintenance procedures**

that over 50% of the reduced with proper carried out.

Canadian Public Health Association (CPHA) surveyed the results of hospital injuries involving children and found climbers, swings and slides were the pieces of playground equipment on which children are most frequently injured.

Statistics found that falls accounted for 44% of injuries in Canada, of which:

- 81% resulted in a fracture
- 14% resulted in a head injury
- 5% other, including dislocation and open wounds

Main injury locations were:

- 38% on climbers
- 25% on swings
- 25% on slides

In addition to falls, other injuries:

- 15% by collision with another child or object
- 1.8% entrapment/entanglement

**Deaths occurring on playgrounds are extremely rare and are usually caused by strangulation when an item of clothing is caught on equipment or head entrapment.**



## ***Risk Management Strategies***

Risk is a measurement of the likelihood of consequences and playgrounds certainly present some elements of risk. It is the purpose of risk management to moderate risk while leaving opportunities for play and growth.

### ***Risk Avoidance***

If the activity that may cause an injury does not take place, there is absolutely no chance of a loss resulting from that activity. This can be restated by saying “if there are no climbers on the playground, then it is impossible to have an injury or claim resulting from the use of a climber.” Avoidance works best with high-risk activities, but this procedure is often not practical or acceptable for moderate risk playground equipment.

### ***Risk Minimization***

This strategy usually requires a great deal of effort which is on-going. Risk minimization often takes the form of loss prevention in that rules and procedures are established to minimize the risk of loss or to limit the severity of a loss.

An organization (school board, day care, etc.) accepts the benefits of the activity taking place exceeding the consequences of any injury that may result from the activity. An organization has accepted the risk of having a playground and uses risk management to take positive steps to reduce the chance of a loss occurring.



## ***Common Terms/Definitions***

### **Duty of Care**

A requirement that a person act towards others (public) with care, attention, caution and prudence that a reasonable person would use. If a person's actions did not meet this standard of care, then the acts are considered 'negligent'.

### **Negligence**

Negligence is a failure to take reasonable care to avoid causing injury or loss to another person.

### **Occupier's Liability**

There is a common duty of care to all those who visit our premises to ensure that they will be reasonably safe in using the premises, or facilities, for the purpose they were allowed in.

To trespassers and others, without permission, we owe a duty to offer protection from dangers or risks on the premises that we are reasonably aware of.

An occupier is a person or organization who has responsibility for and control over the condition of the premises or the activities that take place there. Premises shall be kept in proper repair and inspections conducted and kept on file.

### ***Intended Users***

Schools, daycares, PACs, Maintenance/Custodial, Principals, and school officials.

School boards may have their own requirements for playgrounds, however the safety measures provided in the CSA Playground Manual must be followed.



## Designing Playgrounds

When planning a new playground, it is important to check the proposed site for potential hazards. Pick a location away from roads, driveways and parking lots. If this is not possible, then an appropriate fence should be constructed to keep children from running into dangerous areas. Visibility is very important so the layout should not in any way restrict supervision but allow clear sight lines.

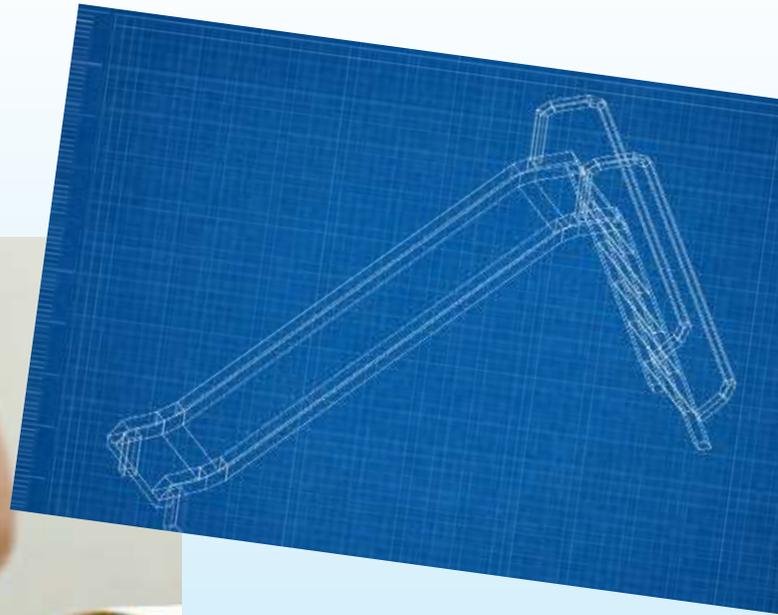
The following points should be considered when planning a playground:

- Pick a site away from obstacles that could cause injuries such as low hanging tree branches, overhead wires, tree stumps and concrete.
- Check the location regarding drainage as heavy rains or melting snow can turn a play area into a swamp. Re-grading may help improve drainage.
- Place metal equipment (such as slides), where feasible, out of direct sunlight to reduce the possibility of serious burns to users.
- Play equipment should be located over 1.8m (6 feet) from other play equipment, buildings, fences, trees, etc. Provide additional space in front of and behind swings.
- Do not crowd equipment together but instead organize different areas where active, physical activities are separate from passive activities. Sandboxes should not be located too close to a swing or slide. Ensure traffic patterns allow children to move safely from one piece of equipment to another.
- Playgrounds should have separate areas for younger children with suitable sized equipment and adequate space for greater supervision.
- Water hazards – absolutely no standing water should be part of a play area.
- Accessibility – accommodation should be provided.
- Conflicting activities – spacing and orientation should be considered to avoid conflict between other physical activities.
- Signage & Supervision.

### Size

Determine if the site is big enough to have a playground that meets your needs. The following items need to fit on that site:

- Play equipment with adequate separation required.
- Protective surfacing that will extend up to 1.8 m (6') in all directions from the equipment.
- Non-encroachment zones beyond the protective surfacing area – typically 1.8m (6').
- Landscaping, seating, refuse containers, etc.



## ***Installation and Assembly***

Follow the instructions carefully as provided by the manufacturer and ensure the equipment is securely anchored. Because of the forces generated by active use, proper anchoring is required to prevent overturning, sliding or tipping. Anchors must be buried and covered with appropriate amount of protective surfacing.

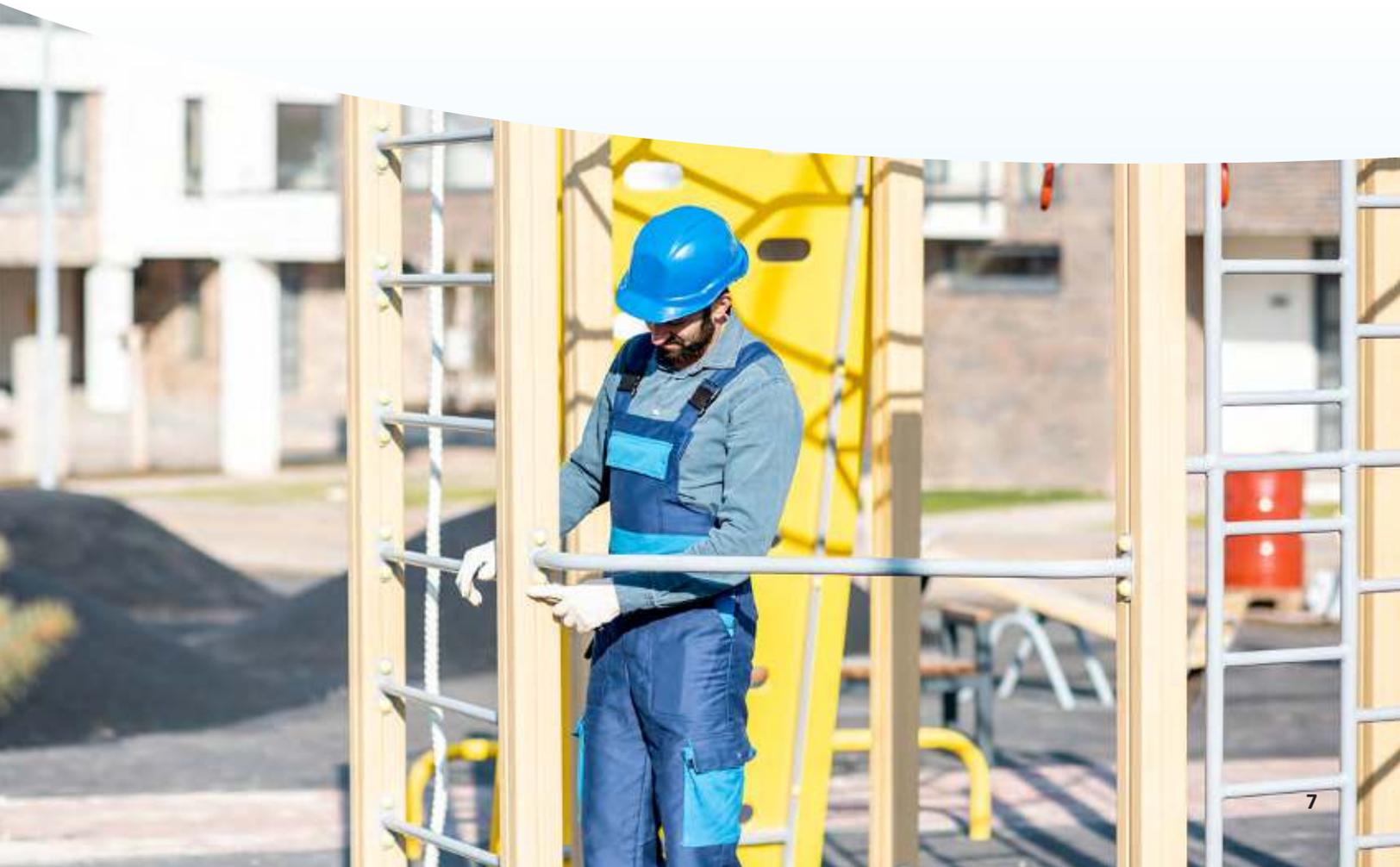
Equipment shouldn't be installed when the ground is frozen therefore May to September are the ideal months for playground construction.

Assembly of equipment should take place under the guidance of the manufacturer's representative or installed completely by a trained crew. No deviation is permitted from the manufacturer's instructions. There shall be clear and concise instructions and procedures for the installation of each play structure. Protective surfacing shall be installed as soon as possible following equipment assembly and the equipment shall not be used until this is done. The site shall be secured during construction when unattended to prevent children from playing on the site. Temporary barricades are required at unprotected openings to incomplete structures. All equipment must be thoroughly inspected before public use by the owner or representative.

The equipment must be kept in excellent condition as this is essential to reducing injuries. Keep a copy of the manufacturer's instructions and parts list so that worn or damaged components can be replaced.

Develop an all inclusive maintenance program for the entire playground. This shall include regularly scheduled inspections for corrosion and breakage with more frequent inspections for foreign material such as broken glass, vandalism and adequate levels of protective surfacing (see appendix, "Surfacing" on page 23).

The type of inspection will depend on the piece of equipment, amount of use and climatic conditions. Checklists should be used for each playground item.



## ***Inspections - Maintaining a Playground***

Maintenance inspections should be a comprehensive program developed for each playground. All playground areas and equipment should be inspected for excessive wear, deterioration, and any potential hazards. A general checklist may be used as a guide for frequent routine inspections.

Detailed inspections should give special attention to moving parts and other parts that can be expected to wear.

Maintenance inspections should be carried out in a systematic manner by those familiar with the playground, such as custodians or maintenance staff.

### **Inspections shall include:**

- checking the entire playground area for hazardous debris or litter.
- checking for any damage such as broken or missing components whether due to wear or vandalism.
- checking for broken, loose, or missing protective barriers, steps, guardrails, etc. and damage to benches, signs and fences.
- checking for items such as strings and ropes that have been tied onto the equipment. These items must be removed immediately.
- rake/till protective surfacing as needed to ensure proper depth and reduce compaction.
- check surface depth regularly and replace as needed

### **Inspection Schedule**

The following three types of inspections are recommended (see Appendix for Inspection Forms):

#### **Daily/Weekly Visual Inspection**

- A visual inspection shall be carried out by the owner, maintenance inspector, care giver, or custodian on a daily basis, if possible, and at least once a week, to identify defects or emerging problems.

#### **Detailed Monthly Inspection**

- A detailed inspection shall be carried out every month, and the results and actions taken entered in a permanent record that can be examined as necessary.

#### **Annual Comprehensive Written Report**

- Every year, comprehensive written reports shall be completed by a qualified playground inspector, and the results and action taken. Results shall be entered in a permanent record that can be examined if necessary.



### **Repairs in Play Spaces**

All repairs shall comply with the current CSA Standard. When a defect is observed, it must be immediately reported and repaired. Details of the defect or problem and remedial action shall be recorded. Should the repair take time, all reasonable steps shall be taken to bar access. Warning or danger signs alone are not acceptable. Damaged or worn components shall be repaired or replaced to the CSA Standard.

User modifications should be removed immediately (ie skipping ropes).

Maintenance and repairs to equipment and the replacement of components must be carried out in strict compliance with the manufacturer's recommendations.

### **Documentation**

All records of inspections and repairs should be entered in a permanent record which can be examined as needed. The person(s) inspecting/repairing should sign and date the record and be forwarded to their supervisor.

Photo records of damaged or broken parts should be included in the report. This could help highlight the hazard and expedite approval.

***TO DEFEND ONE'S ACTIONS, DOCUMENT, DOCUMENT, DOCUMENT!***

## ***Hazards***

### **Head Entrapment**

This is a serious concern since it could lead to strangulation and death. Certain openings could present an entrapment hazard if the distance between openings is greater than 89 mm (3.5 inches) and less than 229 mm (9 inches). **Bicycle helmets should never be allowed to be worn while using a playstructure as they may increase the entrapment hazard.**

### **Entanglement**

Drawstrings (hoodies, jackets) and other upper body clothing (scarves) can be entangled in playground equipment and can cause death by strangulation.

Children should not wear jewellery, any drawstrings or scarves while using playstructures.

All ropes, or similar, that are not originally part of the structure, must be removed as children can become entangled.

### ***Protrusions***

Protrusions on playground equipment should not be capable of entangling children's clothing because such entanglement can cause serious injuries or death by strangulation. All protrusions shall not extend beyond the face of any of the three test gauges.

### **Protrusions and Projections**

Protrusions or projections on playground equipment shall not be capable of entangling children's clothing, because such entanglement can cause death by strangulation, nor should they be large enough to impale. Particular attention should be given to avoid protrusions or projections on slides to minimize the risk of entanglement with clothing, jackets and sweatshirts. Hoods and/or drawstrings have been involved in such entanglement/strangulation incidents. Jewellery, such as necklaces and rings, has also resulted in injuries from entanglement. The diameter of a protrusion should not increase in the direction away from the surrounding surface towards the exposed end **See clauses 12.3.3.2, 12.3.3.3, and 12.4.4.**

Bolts should not be exposed more than 2 threads beyond the end of the nut. All hooks (S or C hooks) should be closed with gaps no more than 0.04 inches (thickness of a dime).

No protrusion should extend beyond the face of any of the three gauges having dimensions. **See clauses 12.2.1.3, 12.3.3.1, 12.3.3.2, 12.4.2, 12.4.3 and 12.4.4**

## **Protrusions on Suspended Members of Swing Assemblies**

### ***Pinch, Crush and Shearing Points***

There shall be no accessible pinch, crush or shearing points on playground equipment that could injure children or catch their clothing. Such points can be caused by components moving relative to each other or to a fixed component when the equipment moves through its anticipated use cycle. When inspecting playground equipment, consider the likelihood of a body part being entrapped and the configuration and closing force of the components.

### ***Sharp Points, Corners and Edges***

There should be no sharp points, corners or edges on any components of playground equipment which could cut or puncture children's skin.

If steel belted radial tires are used, they shall be closely examined regularly to ensure there are no exposed steel belts that could be a protrusion or laceration hazard.

- All metal edges should be rolled or have rounded capping.
- Exposed open ends on pipes should have caps that cannot be removed without the use of tools
- Wood parts should be smooth and free from splinters
- All corners should be rounded
- No sharp edges on slides (check sides and exit)

### ***Suspended Hazards***

Cables, wires, ropes, or similar flexible components suspended between play units or from the ground to a play unit within 45 degrees of horizontal should not be located in areas of high traffic because they may cause injuries to running children. This applies to suspended members at a height of 2100 mm (7 feet) or less. **See clauses 12.3.3.4.1, 12.3.3.4.2, 12.4.2 and figure.**

Suspended Components should be:

- located away from high traffic
- brightly coloured or contrast with surrounding equipment
- tight enough to prevent any looping
- attached at both ends

### ***Tripping Hazards***

All anchoring devices for playground equipment, such as concrete footings or horizontal bars at the bottom of flexible climbers, should be installed below the playing surface to eliminate the hazard of tripping. Attention should be given to environmental obstacles in the play area, including rocks, roots, and other protrusions from the ground that may cause children to trip.

- all play areas should be free of tripping hazards
- anchoring device, concrete footings or horizontal bars should be installed below ground level
- surface containment walls should be highly visible
- any change of elevation should be obvious

### ***Tires***

Used tires should be:

- examined closely to ensure that there are no exposed steel belts/wires
- provided with drainage holes to reduce water accumulation.
- any tire used as a play area extending 406 mm (16 inches) or over above the ground must be surrounded by protective surfacing.

### ***Openings and Angles***

A component or a group of components should not form openings that could trap a child's head.

The angle of any components should not be less than 55 degrees upward. An exception can be made if a rigid shield is attached and the shield is of sufficient size to prevent a 225 mm (9 inches) diameter test gauge from simultaneously touching components on either side.

## Parts of the Playground

### Requirements for Access/Egress

Access to playground equipment is varied and may be by means of ramps, steps, ladders, climbing nets, arch climbers and tire climbers. Stairways, ramps and ladders have a range of slopes permitted for these types of access. CAN/CSA-Z614-14 table contains recommended dimensions for access slope, tread or rung width, tread depth, rung diameter and vertical rise. Openings between adjacent steps or rungs must prevent the possibility of entrapment. (Appendix Page 30)

### Handrails

Continuous handrails shall extend over the full length of the access and must be provided on both sides of all stairways and stepladders.

The appropriate measurements are provided in **Clause 13.1.4 in CAN/CSA-Z614-14**.

Handrails are intended to provide hand support and to steady the user.

Heights for preschool – 559 - 660 mm (22"-26")

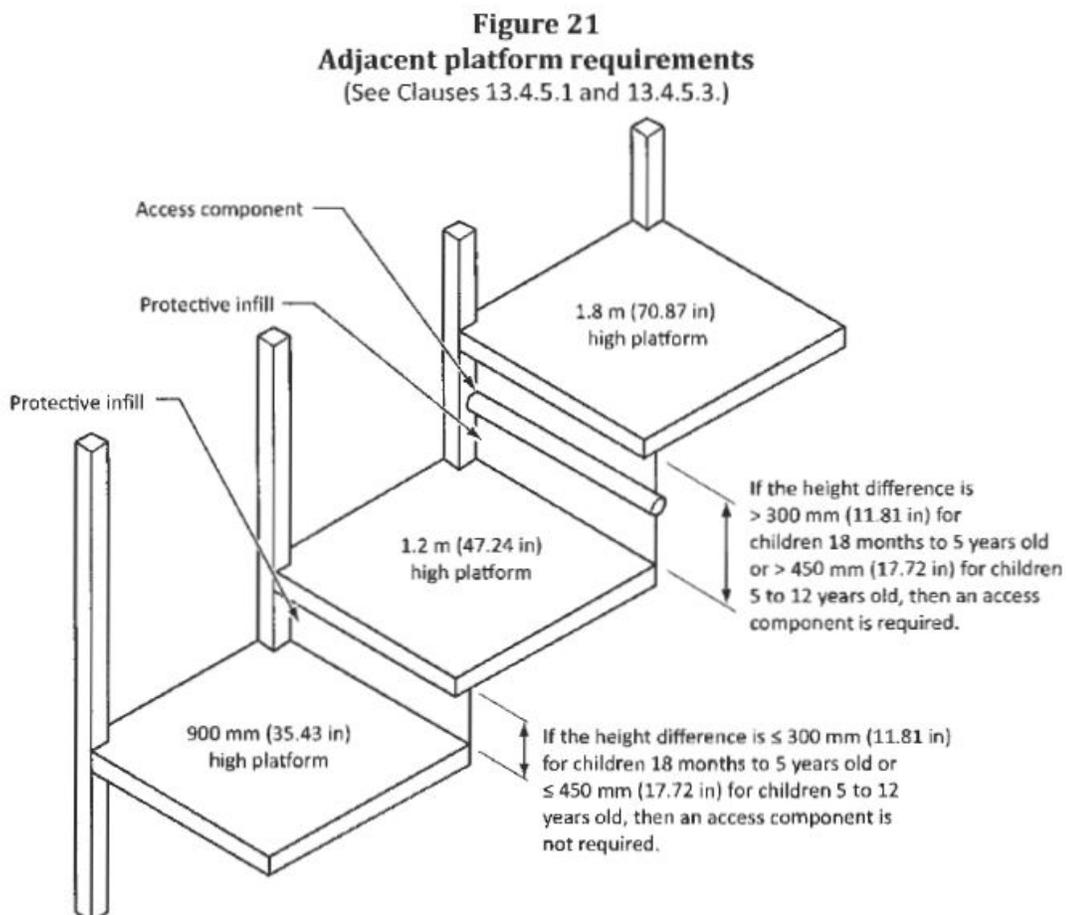
Heights for School Age – 559 - 965 mm (22"-38")

### Transition from Access to Platform

On stairways and stepladders, there shall be a continuation of handrails from the access to the platform.

On accesses that do not have side handrails, such as rung ladders, arch climbers, or flexible components, there shall be alternative hand-gripping support to facilitate the transition to the platform.

For rung ladders, flexible components, and arch climbers, the stepping surface used for final access shall not be above the designated play surface it serves.



Guardrails shall completely surround the elevated surface, except for entrance and exit openings necessary for each event. Means of ascent and descent, except at access points for stairs and ramps, that are accessible by openings in guardrails with horizontal dimensions greater than 375 mm (15 in) shall have a minimum of one top rail.

The top surface of guardrails shall have a height of 725 mm (29 in) or greater when the elevated surface is for use by children aged 18 months to 5 years old, and 950 mm (38 in) or greater when for use by children aged 5 to 12 years old.

The lower edge of guardrails on elevated surfaces intended for children aged 18 months to 5 years old shall be no greater than 575 mm (23 in) above the underlying equipment surface. For elevated surfaces intended for children aged 5 to 12 years old, the lower edge of the guardrails shall be no greater than 700 mm (28 in) above the underlying equipment surface.

### Guardrails and Protective Barriers

Either guardrails or protective barriers may be used to prevent unintentional falls off elevated platforms. Protective barriers provide a greater degree of protection as they should deter children climbing over or through the barrier. The protective barrier shall be complete around the elevated surface except for entrance and exit openings.

#### Pre-School Age Children

An elevated surface that is more than 508 mm (20 inches) above the underlying surface should have a guardrail or protective barrier to prevent falls. Guardrails are acceptable for platforms greater than 508 mm (20 inches) and less than or equal to 762 mm (30 inches) high. A full protective barrier may be preferable here but a protective barrier is definitely required for platforms that exceed 762 mm (30 inches) in height.

#### School Age Children

An elevated surface that is more than 762 mm (30 inches) above the underlying surface should have a guardrail or protective barrier to prevent falls. For platforms greater than 762 mm (30 inches) and less than or equal to 1,219 mm (48 inches) high, guardrails are acceptable although a full protective barrier always provides greater protection. Platforms that exceed 1,219 mm (48 inches) in height shall always have a protective barrier.

**Table 4. Guardrails and Barriers**

	Guardrail	Barrier
Protects against accidental falls from platform	Yes	Yes
Discourages climbing over	No	Yes
Protects against climbing through	No	Yes
<b>Toddlers</b>		
A Top edge distance from platform	Not recommended	A = 24" or higher
B Bottom edge distance from platform	Not recommended	B < 3"
H Recommended when platform fall height is:	Not recommended	H = 18" or higher
<b>Preschool-age</b>		
A Top edge distance from platform	A = 29" or higher	A = 29" or higher
B Bottom edge distance from platform	9" < B ≤ 23"	B < 3.5"
H Recommended when platform fall height is:	20" < H ≤ 30"	H > 30"
<b>School-age</b>		
A Top edge distance from platform	A = 38" or higher	A = 38" or higher
B Bottom edge distance from platform	9" < B ≤ 28"	B < 3.5"
H Recommended when platform fall height is:	30" < H ≤ 48"	H > 48"

## **Pre-School Age Children**

The top surface of guardrails should be at least 736 mm (29 inches) high and the lower edge should be no more than 584 mm (23 inches) above the platform.

## **School Age Children**

The top surface of guardrails should be at least 965 mm (38 inches) high and the lower edge should be no more than 660 mm (26 inches) above the platform.

## **Pre-School Age Children**

The top surface of protective barriers should be at least 736 mm (29 inches) high.

## **School Age Children**

The top surface of protective barriers should be at least 965 mm (38 inches) high.

Both guardrails and protective barriers should be designed to prevent unintentional falls off the platform, prevent the possibility of entrapment and facilitate supervision. Horizontal cross-pieces shall not be used as infill for the space below the top rail because they provide footholds for climbing.

## ***Platforms***

Guardrails or protective barriers shall be used to prevent falls off elevated platforms and shall be provided on platforms, walkways, landings and transitional surfaces. There shall be no designated play areas on guardrails and protective barriers and the design should minimize the possibility of climbing.

## ***Stepped Platforms***

Some composite structures have layered or tiered platforms. Falls from a higher platform can be terminated by a lower platform rather than by the ground surface. Unless there is an alternate means of access/egress, the maximum difference in height between stepped platforms should be:

**Pre-School Age Children**      305 mm (12 inches)

**School Age Children**      457 mm (18 inches)

On some composite structures, there are layered or tiered platforms between the higher platform and the ground surface. The height difference between platforms shall be a maximum of 300 mm (12 in.) for children under five years of age and 450 mm (18 in.) for children older than five. Infill shall be used to reduce the space between platforms to prevent the possibility of entrapment.

## ***Playspace Layout***

Each playstructure requires an area of protective surfacing that corresponds to the fall zone. The fall zone is the area under and adjacent to a playstructure where it is reasonable to expect that a child may land after a fall. The depth and other dimensions of the protective surfacing are dependent on the fall height. The fall height can be considered as an approximation of the maximum fall height from which a life threatening head injury would not be expected to occur. The surfacing material should have a depth that is relative to the height of the highest accessible part of the equipment.

## **No-Encroachment Zone**

There shall be a no-encroachment zone surrounding the protective surfacing zone of moving equipment and in front of the protective surfacing zone of slides.

The no-encroachment zone shall extend at least 1800 mm (72 in) past the protective surfacing zone.

Each piece of playground equipment must have its own protective surfacing area and they shall not overlap. It is acceptable for adjacent pieces of playground equipment to share a single no-encroachment zone.

## Typical Playground Equipment

### Balance Beams

No higher than:

Pre-school – 305 mm (12 inches) above surface protection

School Age – 406 mm (16 inches)

### Climbers

Climbers are designed to present a greater degree of physical challenge than other equipment. Composite structures with linked platforms are also included.

Climbers refer to a wide variety, but not limited to:

- Arch climbers
- Climbing Walls
- Dome
- Netting
- Parallel Bars
- Sliding Poles
- Spiral Climbers
- Upper Body (overhead ladders, track rides)

Climber layouts should be compatible with traffic flow from nearby components. They should be placed so that swinging movement generated by children cannot interfere with movement of children on adjacent structures.

Fall height on climbers should be determined as the distance between the highest part of the climber and the surface beneath.

Rungs should be generally round and secured to prevent them from turning.

All climbers should be spaced (extend) a minimum of 1.8 m (6') in all directions from other climbers as well as surrounding equipment, buildings, fences and trees.

Climbers must not have any bars or rigid structural components in the interior of the climber.

Individual vertically suspended climbing ropes are recommended only if they are securely fastened to a footing at the lower end to prevent the rope from being looped back on itself and forming a noose.

### Climbers and Non-Rigid Components

Net and chain climbers use a flexible grid of ropes or chains for climbing.

Flexible grid climbing devices which provide access to platforms should be securely anchored at both ends. When one end is connected to the ground, the anchoring devices shall be below the level of the protective surface.

Connections between ropes, cables, or chains within the climbing grid must be securely fixed. Spacing between the horizontal and vertical components of a climbing grid must satisfy all entrapment criteria.



## Arch Climbers

Arch climbers consist of metal or wood rungs attached to convex side supports. They may be free standing or be provided as a more challenging means of access to other equipment.

## Horizontal Ladders and Overhead Rings

Five year-olds are generally the youngest children capable of using upper body devices such as these. The recommendations below are, therefore, designed to accommodate children 5 through 12 years of age.

The space between adjacent rungs of overhead ladders should be greater than 229 mm (9 inches) to satisfy the entrapment requirements. The center-to-center spacing of horizontal ladder rungs should not exceed 381 mm (15 inches). This does not apply to the spacing of overhead rings because, during use, the gripped ring swings through an arc and reduces the distance to the gripping surface of the next ring.

The first handhold on either end of upper body equipment should not be placed directly above the platform or climbing rung used for mount or dismount. This minimizes the risk of children impacting rigid access structures if they fall from the first handhold during mount or dismount.

## Sliding Poles

Vertical sliding poles are designed to be more challenging than some other types of climbing equipment. They are not recommended for preschool-age children who may lack the requisite upper body strength and coordination to successfully slide down the pole. Furthermore, once younger children have grasped the pole, they would be forced to slide down it since there is no alternative option.

Sliding poles should be continuous with no protruding welds or seams along the sliding surface and the pole should not change direction along the sliding portion.

The horizontal distance between a sliding pole and the edge of the platform or other structure used for access to the sliding pole should be at least 457 mm (18 inches). This minimum distance applies to all points down the sliding pole.

All points on the sliding pole at or above the level of the access structure, where a child is likely to reach for the pole, should not be more than 508 mm (20 inches) away from the edge of the access structure.

The pole should extend at least 965 mm (38 inches) above the level of the platform or other structure used for access to the sliding pole.

The diameter of sliding poles should be no greater than 48 mm (1.9 inches). The design of the access structure should minimize the possibility of interference from surrounding traffic that may be out of the line of sight of a user during descent.



## Climbing Ropes

Individual vertically suspended climbing ropes are recommended only if they are securely fastened to a footing at the lower end to prevent the rope from being looped back on itself and forming a noose.

## Layout of Climbing Components

When climbing components are part of a composite structure, their level of challenge and mode of use should be compatible with the traffic flow from adjacent components.

The swinging movements generated on upper body devices warrant special precautions to reduce the risk of impact with children on adjacent structures. Upper body devices should be placed so that swinging children cannot interfere with the movement of children on adjacent structures, particularly with their descent on slides.

The design of adjacent play structures should not facilitate climbing to the top support bars of upper body equipment.

## Track Rides/Zip Lines

Track rides are a form of upper body equipment where the child holds onto a handle or other device, along a track above their head. Track rides require significant upper body strength and judgement when it is safe to let go. Due to the skill required, track rides are only recommended for school age children.

- No obstacles along the path or anything to interfere with take off or landing.
- nothing should be tied or attached to any moving part of a track ride.
- moving parts should be enclosed to prevent crush hazards.
- Zip lines are a higher level of difficulty and may require additional consideration to reduce potential hazards. Further evaluation will be needed.

See clauses 14.8, 15.13.1, and 15.13.3

## Climbing Walls

Climbing walls can consist of small sloped wall access to a play structure, to a freestanding climbing structure. Various degrees of difficulty specific to age restrictions.

- hand and foot holds must be secured and free of cracks.
- climbing ropes must be attached at the top and bottom of the wall.
- protective surfacing beneath the structure(s) must be maintained at adequate depth based on the fall height.



## Log Rolls

Log rolls help with school age children master balance skills and increase strength. Children must balance on top of the log as they spin it with their feet.

- recommended for school age.
- should have hand holds to assist with balance.
- highest point is max of 457 mm (18") above protective surfacing.
- at least 1.8 m (6') distance between equipment.



## Slides

### Slide Access

With the exception of embankment slides, access to a slide may be by means of a ladder with rungs or steps, a stairway with steps, or the slide may be a component of a composite play structure to which access is provided by other means.

### Slide Platform

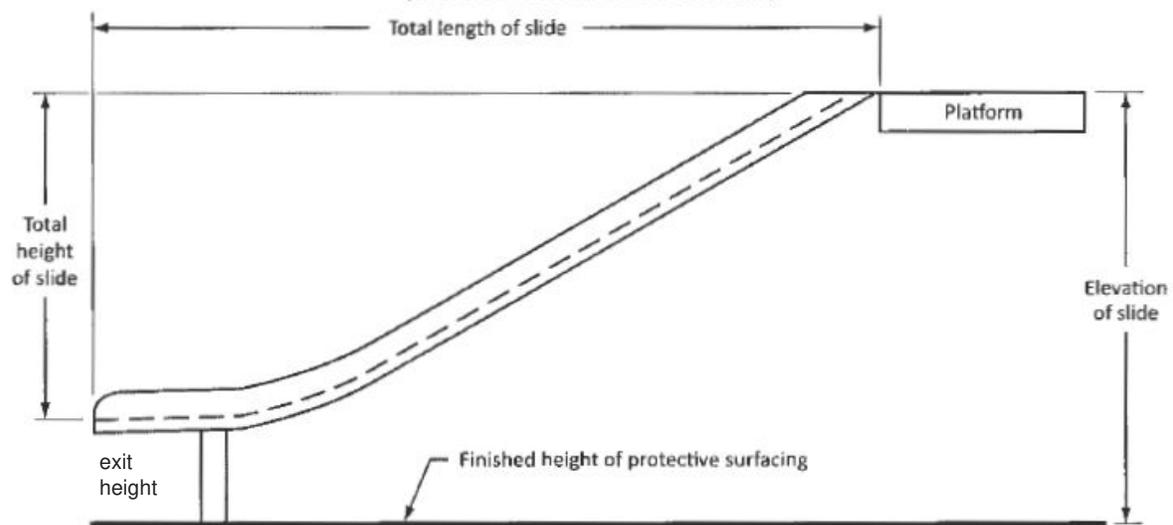
All slides should be provided with a platform with sufficient length to facilitate the transition from standing to sitting at the top of the inclined sliding surface. The length of the platform will usually not be an issue when the slide is attached to the deck of a composite structure, because decks are generally at least 1 m (3 feet) square. However, in the case of a free-standing slide, it is recommended that the platform have a minimum length of at least 559 mm (22 inches).

The platform should be horizontal and have a width at least equal to the width of the slide. Guardrails or protective barriers should surround a slide platform. Slides should not have any spaces or gaps between the platform and the start of the slide chute. With the exception of tube slides, handholds should be provided at the entrance to all slides to facilitate the transition from standing to sitting and decrease the risk of falls.

At the entrance to the chute there should be a means to channel a user into a sitting position. This may be a guardrail, a hood, or other device. Whatever means is provided, it should be of a design that does not encourage climbing.



**Figure 37**  
**Height/length ratio of the sliding surface**  
(See Clauses 14.1.3 and 15.5.5.1.)



**Note:** The height of the sliding surface divided by the length of the sliding surface shall not exceed 0.577.

### ***Sliding Section of Straight Slides***

It is recommended that the average incline of a slide chute be no more than 30 degrees. This can be measured by determining that the height to length ratio (as shown in Figure 37) does not exceed 0.577. No span on the slide chute should have a slope greater than 50 degrees.

Straight slides with flat open chutes should have sides with a 102 mm (4 inch) minimum height extending along both sides of the chute for the entire length of the inclined sliding surface.

The sides should be an integral part of the chute, without any gaps between the sides and the sliding surface.

Metal slides should be placed in shaded areas to prevent burns caused by direct sun on the slide chute.

### ***Exit region***

All slides should have an exit region to help children maintain their balance and facilitate a smooth transition from sitting to standing when exiting.

The exit region should be essentially horizontal and parallel to the ground and have a minimum length of 279 mm (11 inches). Refer to the current CSA standards for additional information on slides.



## Teeter-Totters (See-Saws)

Typical teeter-totters consists of a support pole with a seat (or two – Note: photo shows two seats) at each end supported at the center with a fulcrum. No footrests (but may be built into newer units – Note: photo shows footrests).



- The center, or fulcrum, should not present a crush hazard
- shock absorbing material should be embedded in the ground (ie. Tires underneath the seats either in the ground, unless built into the unit mechanism or secured to the underside of the seat)
- maximum angle of 25 degrees from horizontal
- traditionally no footrests
- 1.8 m (6') distance between equipment

See clause 15.9

## Spring Rockers

Small bouncing or rocking seats, primarily designed for pre-school children.

- typically one user only
- 356 - 711 mm (14"-28") high limit
- should be equipped with handgrips and footrests
- springs must be CSA compliant to prevent finger and toe pinch points
- 1.8 m (6') distance zone required



## Swings

Swings may be divided into two distinct types, single axis of motion and multiple axes of motion. A single axis swing is intended to swing back-and-forth in a single plane and generally consists of a seat supported by at least two suspending members each of which is connected to a separate pivot on an overhead structure. A multiple-axis swing consists of a seat suspended that permits it to swing in any direction.

Hardware used to secure the suspending elements to the swing seat and to the supporting structure should not be removable without the use of tools. S-hooks are still used to attach the suspending elements to the overhead support bar or to the swing seat. Open S-hooks are hazardous because they can catch a child's clothing and result in strangulation. S-hooks should be pinched closed as tightly as possible. S-hooks are being replaced with a new clevis style system which reduces the hazard.

Swing support structures should discourage climbing and A-frame support structures shall not have horizontal cross-bars.

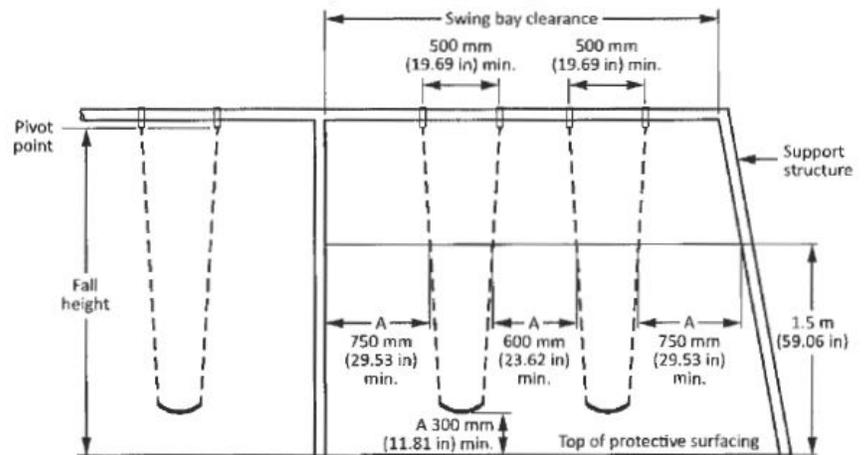
Most swing seats are designed to accommodate one user at any time and wood or metal seats are **NOT** permitted.

To help prevent young children from running into the path of moving swings, swing structures shall be located away from other equipment or activities. To minimize the likelihood of children being struck by a moving swing, it is recommended that no more than two single axis swings be hung in each bay of the supporting structure.

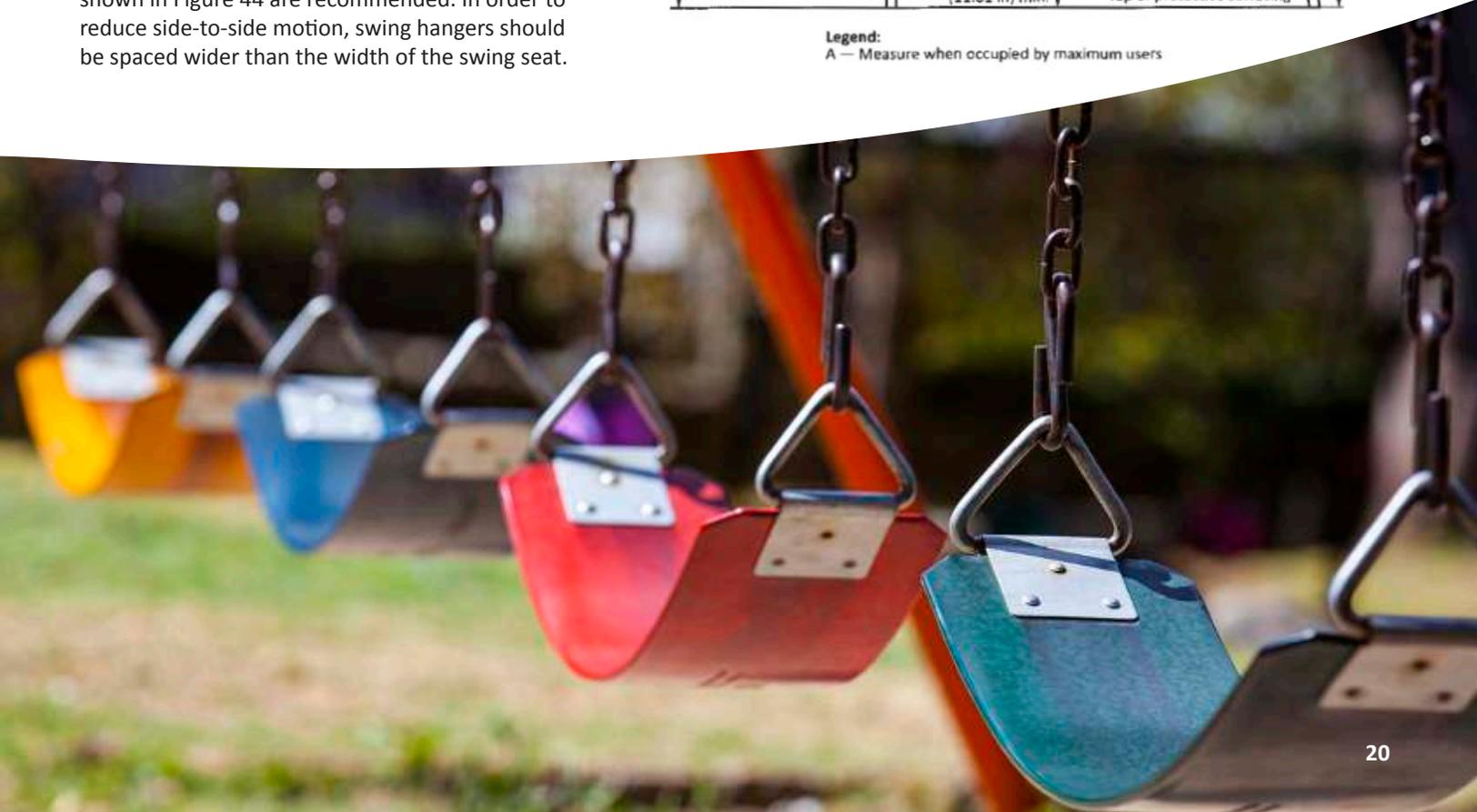
To minimize collisions between swings or between a swing and the supporting structure, the clearances shown in Figure 44 are recommended. In order to reduce side-to-side motion, swing hangers should be spaced wider than the width of the swing seat.



**Figure 44**  
**Single axis swings**  
(See Clause 15.6.5.1.)



**Legend:**  
A — Measure when occupied by maximum users



## Clearances

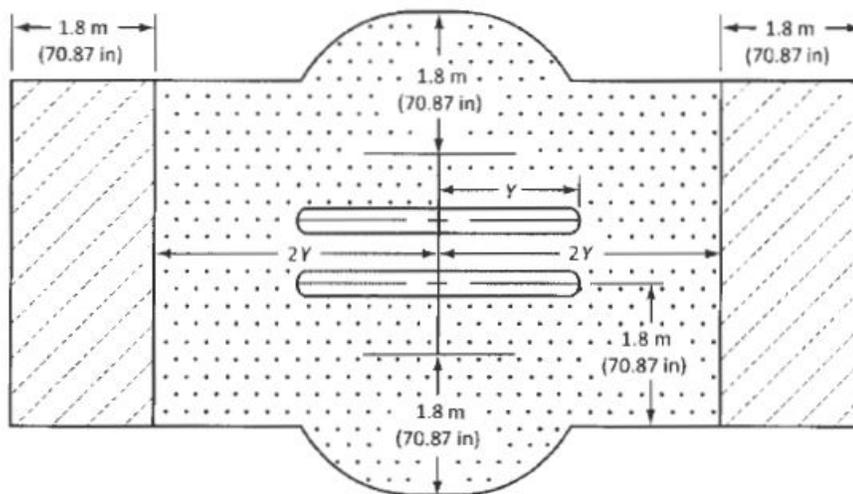
The horizontal distance between swing seats at rest, when occupied, shall be no less than 600 mm (24 inches) when measured 1.5 m (59 inches) above the protective surfacing.

The horizontal distance between the supporting structure and the adjacent single axis swing seat when occupied, shall not be less than 750 mm (30 inches) when measured at 1.5 m (59 inches) above the protective surfacing.

The horizontal distance between the hangers supporting a single axis swing seat shall be greater than the width of the seat, and shall not be less than 500 mm (20 inches).

The vertical distance between the underside of the occupied seat and the protective surfacing shall not be less than 300 mm (12 inches).

**Figure 27**  
**Protective surfacing and no-encroachment zones for single axis swings**  
(See Clauses 14.4.1.1 and 14.4.1.5.)



Protective surfacing zone



No-encroachment zone

**Conversions (approx.)**

300 mm = 12 inches

500 mm = 20 inches

600 mm = 24 inches

## Bucket Seat Swings

These are single axis swings intended for very young children to use with adult assistance. The seats and suspension systems of these swings, including the related hardware, should follow all of the other criteria for conventional single axis swings. Bucket seats shall provide support on all sides of a child and these supports must not present a strangulation hazard.



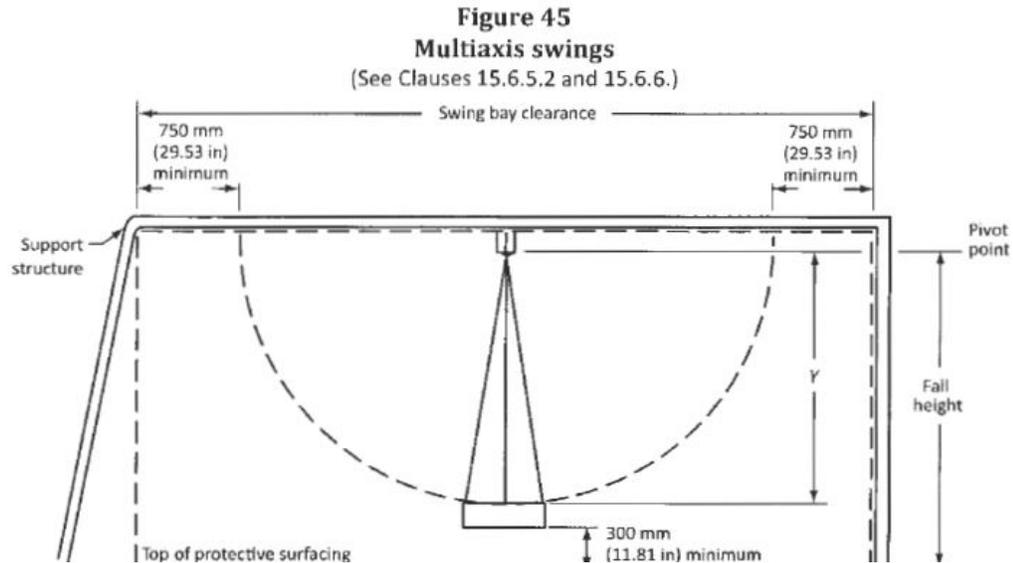
## Multi-Axis Swings

Multi-Axis swings are typically suspended in a horizontal orientation using three (or four) suspension chains or cables. (– Note: photo shows four) connected to a single swivel mechanism that permits both rotation and a swinging motion in any axis. Only one multi-axis swing shall be located in the same bay.

The likelihood of hanger mechanism failure is increased for multi-user swings, due to the added stress of rotational movement and multiple occupancy. **Special attention to maintenance is warranted and the hanger mechanism should not have any accessible pinch points.**

Multi-axis swings shall be located away from other play structures or activity areas.

The minimum clearance between the seating surface of a tire swing and the uprights of the supporting structure should be 750 mm (30 inches) when the tire is in a position closest to the support structure. The vertical distance between the underside of the rotating seat, when occupied by the design capacity of maximum users, and the protective surfacing shall not be less than 300 mm (12 inches).



see clauses 14.4.2.1,  
14.4.2.2.3, and 14.4.2.4.



## Merry Go Rounds

Merry go rounds are rotating equipment found on some playgrounds. Children usually sit or stand on the platform while other children or adults push the merry go round to make it rotate. In addition, children often get on and off while it is in motion. They may present a physical hazard to pre-school children.

- platform surface should not have any openings.
- means should be provided to limit the speed of rotation to a maximum of 13 feet per second.
- underside of the platform should be less than 89 mm (3.5 inches) or more than 228.9 mm (9 inches) from the level of the protective surfacing.



## Surfacing

The surface under and around playground equipment can be a major factor in determining the injury-causing potential of a fall. A fall onto a shock absorbing surface is less likely to cause a serious injury than a fall onto a hard surface. The more shock absorbing a surface can be made, the more the likelihood that the severity of the injury will be reduced. **It must be recognized that all injuries due to falls cannot be prevented no matter what playground surfacing material is used.**

**Under current CSA guidelines, there is no acceptable protective surfacing during winter months.**

The Critical Height of a surfacing material can be considered as an approximation of the fall height below which a life-threatening head injury would not be expected to occur. The surfacing material used under and around a particular piece of playground equipment should have a Critical Height value of at least the height of the highest designated play surface on the equipment. This height is the fall height for the equipment.

### ***Types of Surfacing - Loose Fill and Synthetic***

A playground should never be installed without protective surfacing of some type. Grass and dirt are not considered protective surfacing as it has no shock absorbing effectiveness. Never use concrete, asphalt or other hard surfaces.

#### ***Loose Fill***

- Sand.
- Pea gravel.
- Wood fibre/engineered wood fibre.
- Shredded rubber (not recommended).

Loose fill will compress over time and will need frequent maintenance, tilling and replenishment to ensure levels are CSA compliant. Areas under swings and slide exits are susceptible to displacement of surface material and extra maintenance and replenishment is required in these areas.

Perimeter of playground should provide a method of containing loose-fill materials. Good drainage is essential. Minimum of 254 mm (10") depth is required at all times.

Only use approved wood mulch.

#### ***Synthetic Fill***

- Generally poured in place unitary materials.
- Good shock absorbing material.
- Minimal maintenance.
- Higher initial cost.

## ACQ

Alkaline copper quaternary, usually abbreviated ACQ, is a type of water-based wood preservative product. ACQ is registered for use on lumber, timbers, landscape ties, fence posts, building and utility poles, decking, wood shingles, and other wood structures.

Material Type	Characteristics	Advantages	Disadvantages	Maintenance
<b>Loose fill materials</b>				
<b>Sand</b>	A natural, clean, and non-packing material. Size, texture, and composition of particles can vary. Some sand types are not appropriate for playground use because of a tendency to compact. With 300 mm (11.81 in) depth of material, an impact attenuation of more than 2.5 m (98.43 in) critical height, depending on the type of sand, can be achieved.	<ul style="list-style-type: none"> <li>• Low to medium cost</li> <li>• Easy to obtain</li> <li>• Easy to install</li> <li>• Durable</li> <li>• Non-flammable</li> <li>• Some types provide excellent impact absorption qualities</li> <li>• Does not support microbial growth</li> </ul>	<ul style="list-style-type: none"> <li>• Can be hard to walk on</li> <li>• Cannot be used with wheelchairs or other mobility aides</li> <li>• Can be swallowed or get into user's eyes, hair, clothes, and shoes</li> <li>• Can hide insects, animal excrement, and sharp objects</li> <li>• Can be thrown, scattered, or tracked onto other surfaces</li> <li>• Moisture, high humidity, and freezing temperatures can reduce effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Can have higher ongoing maintenance costs (due to kick-out, redistribution, topping-up, etc.)</li> <li>• Requires regular inspection, periodic raking, levelling and sifting of compacted sand, removal of foreign matter</li> <li>• Requires periodic addition of sand to tip it up, typically every 1 to 3 years</li> <li>• Subsurface preparation is essential; it should not be installed over asphalt or concrete</li> </ul>
<b>Pea gravel</b>	Pea gravel consists of small, clean, and rounded particles. Crushed, broken, or irregular particle sized should be avoided. With 300 mm (11.81 in) depth of clean material, impact attenuation up to 2.5 m (98.43 in) critical height can be achieved.	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• East to obtain</li> <li>• Easy to install</li> <li>• Less attractive than sand to animals</li> <li>• Non-flammable</li> <li>• Does not support microbial growth</li> <li>• Can provide good drainage with proper base</li> </ul>	<ul style="list-style-type: none"> <li>• Can be hard to walk on and cannot be used with wheelchairs or other mobility aides</li> <li>• Can conceal insects, animal excrement, and sharp objects</li> <li>• Can be swallowed and put in ears or nose</li> <li>• Potential of formation of "hard pan" under surface</li> <li>• Can be thrown, scattered, and tracked onto other surfaces, it can contribute to slip-fall injuries</li> <li>• Moisture, high humidity, and freezing temperatures can reduce its effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Can have higher ongoing maintenance costs (due to kick-out, redistribution, top-ping-up, etc.)</li> <li>• Requires regular inspection, periodic raking, and removal of foreign matter</li> <li>• Requires periodic addition of gravel to top it up, typically every 1 to 2 years</li> <li>• Clean-up of adjacent lawns and sidewalks is necessary</li> <li>• Subsurface preparation is essential; it should not be installed over asphalt or concrete</li> </ul>
<b>Wood/bark mulch</b>	Bark mulch comes from trees used in urban tree management and landscaping programs. Bark mulch can contain twigs and leaves. Wood chips generally do not contain twigs or leaves. Wood sources should be checked prior to chipping for toxins or allergens. With a 300 mm (11.81 in) depth of material, critical height of up to 3 m (118.11 in) can be obtained.	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Easy to obtain</li> <li>• Attractive natural appearance</li> <li>• Retards insect infestation and fungal growth with its mildly acidic composition</li> </ul>	<ul style="list-style-type: none"> <li>• Can be swallowed or get into user's eyes</li> <li>• Can be thrown or scattered</li> <li>• Decomposes and compacts over time</li> <li>• Can conceal animal excrement and sharp objects</li> <li>• Supports microbial growth when wet</li> <li>• Moisture, high humidity, and freezing temperatures can reduce effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Can have higher on-going maintenance costs (due to kick-out, redistribution, topping up, etc.)</li> <li>• Requires regular inspection, periodic raking, and removal of foreign matter</li> <li>• Requires periodic addition and replacement of bark mulch or wood chips, typically every 1 to 3 years</li> <li>• Should not be installed over asphalt or concrete</li> </ul>

Material Type	Characteristics	Advantages	Disadvantages	Maintenance
<b>Engineered wood fibre</b>	Engineered wood fibre is processed new or virgin wood. It contains no twigs or leaves. The wood source should be checked prior to chipping for toxins and allergens. Installation over asphalt or concrete can result in reduced impact results. With a 300 mm (11.81 in) depth of material, a critical height of more than 3 m (118.11 in) can be obtained	<ul style="list-style-type: none"> <li>• Wheelchair accessible</li> <li>• Fairly durable</li> <li>• Easy to obtain</li> <li>• Less abrasive than sand</li> <li>• Retards insect infestation and fungal growth</li> <li>• Free of twigs and leaves</li> <li>• Free of coniferous</li> <li>• Stays in place better than other loose leaf surface material (e.g. sand, pea gravel)</li> <li>• Can be installed over hard surfaces under certain conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Initially more expensive than other loose fill options</li> <li>• Can conceal insects, animal excrement, and sharp objects</li> <li>• Supports microbial growth when wet</li> <li>• Moisture, high humidity, and freezing temperatures can reduce its effectiveness</li> <li>• Decomposes and compacts over time</li> </ul>	<ul style="list-style-type: none"> <li>• Can have higher ongoing maintenance costs (due to kick-out, redistribution, topping up, etc).</li> <li>• Requires regular inspection, periodic raking, and removal of foreign matter</li> <li>• Requires periodic addition and replacement of engineered wood fibre, typically every 3 to 5 years</li> <li>• Adequate drainage is essential and will lower long-term maintenance costs</li> <li>• Engineered wood fibre should not be worked or loosened</li> </ul>
<b>Shredded tire crumb</b>	Rubber crumb is created by grinding up of tire material. For playground use, rubber crumb should be free of metal or wire from the reprocessing of tires. Suppliers should also be able to confirm that the rubber does not contain lead, other toxins or allergens such as latex. Installation over asphalt or concrete can result in reduced impact results. With a 200 mm (7.87 in) depth of material, a critical height of more than 3 m (118.11 in) can be achieved.	<ul style="list-style-type: none"> <li>• Durable</li> <li>• Easy to install</li> <li>• Non-abrasive</li> <li>• Does not support microbial growth</li> <li>• Less attractive to animals</li> <li>• Some types of rubber crumb are wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>• Can conceal insects, animal excrement, and sharp objects</li> <li>• Wide variation in quality</li> <li>• Can contain wire or metal, or other toxins (e.g. lead, latex)</li> <li>• Can be thrown or scattered</li> <li>• Can hide foreign matter</li> <li>• Can be lodged in ears or nose, or dust particles can enter and remain in lungs</li> </ul>	<ul style="list-style-type: none"> <li>• Can have higher ongoing maintenance costs (due to kick-out, redistribution, topping-up, etc.)</li> <li>• Requires regular inspection, periodic raking, and removal of foreign matter</li> <li>• Requires periodic addition and replacement of surface material typically every 2 to 5 years</li> </ul>

Material Type	Characteristics	Advantages	Disadvantages	Maintenance
<b>Unitary synthetic materials</b>				
<b>Tiles</b>	Synthetic tiles and mats are a combination of a chemical binder and a rubber filler. Tiles are available in various thicknesses, lengths, colours, and patterns. The tiles must be installed according to the manufacturer's instructions. Installation over asphalt or concrete can cause poor impact results without adequate subgrade preparation. A critical height of up to 3 m (118.11 in) can typically be achieved; however the attenuation results are highly variable depending upon the manufacturer, type of rubber and depth.	<ul style="list-style-type: none"> <li>• Wheelchair accessible</li> <li>• Stays in place</li> <li>• Easy to clean</li> <li>• Consistent impact-absorbing qualities</li> <li>• Lower maintenance costs over the long term</li> <li>• Decomposes slowly</li> <li>• Tends to have better impact attenuation properties than tile surfacing</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive than other surfacing materials because pour-in-place typically has a shorter lifespan than the equipment</li> <li>• Requires professional installation</li> <li>• Wide variation in quality</li> <li>• Will lose impact-attenuating properties over time</li> </ul>	<ul style="list-style-type: none"> <li>• Regular inspection for damage and debris</li> <li>• General maintenance cost involves sweeping, blowing, or vacuuming debris from surface</li> <li>• Damaged or worn tiles can be replaced</li> <li>• Tiles will need to be replaced when they lose their impact-absorbing ability</li> <li>• A blower or vacuum is sometimes required to remove debris from air pockets found in tile surfaces</li> </ul>
<b>Pour-in-place</b>	Pour-in-place is a seamless synthetic surface that is formed with a chemical binder and a rubber filler. It can be installed on concrete or asphalt but must be used at suitable thickness and be well anchored. A critical height of up to 3 m(118.11 in) can typically be achieved; however, the attenuation results are highly variable depending upon the manufacturer, type of rubber, and depth.	<ul style="list-style-type: none"> <li>• Wheelchair accessible</li> <li>• Stays in place</li> <li>• Easy to clean</li> <li>• Consistent impact-absorbing qualities</li> <li>• Lower maintenance costs over the long term</li> <li>• Decomposes slowly</li> <li>• Tends to have better impact attenuation properties than tile surfacing</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive than other surfacing materials because pour-in-place typically has a shorter lifespan than the equipment</li> <li>• Requires professional installation</li> <li>• Wide variation in quality</li> <li>• Will lose impact-attenuating properties over time</li> </ul>	<ul style="list-style-type: none"> <li>• Regular inspection for damage and debris</li> <li>• General maintenance cost involves sweeping, blowing, or vacuuming debris from surface</li> <li>• Surface can be repaired</li> <li>• Rubber surface will need to be replaced when it loses its impact-absorbing ability</li> <li>• Must be swept free of dirt and other debris that can collect and decrease its shock absorption</li> <li>• A blower or vacuum is sometimes required to remove debris from air pockets found in thile surface</li> </ul>

<https://www.epso.gov/s3fs-public/325.pdf>

 <p> <b>Appropriate Surfacing</b></p> <ul style="list-style-type: none"> <li>• Any material tested to ASTM F1292, including unitary surfaces, engineered wood fiber, etc.</li> <li>• Pea gravel</li> <li>• Sand</li> <li>• Shredded/recycled rubber mulch</li> <li>• Wood mulch (not CCA-treated)</li> <li>• Wood chips</li> </ul>	 <p> <b>Inappropriate Surfacing</b></p> <ul style="list-style-type: none"> <li>• Asphalt</li> <li>• Carpet not tested to ASTM F1292</li> <li>• Concrete</li> <li>• Dirt</li> <li>• Grass</li> <li>• CCA treated wood mulch</li> </ul>
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## Appendix

### Protrusion Test Procedure

**Step 1:** Successively place each projection test gauge over any projection.

**Step 2:** Visually determine if the projection penetrates through the hole and beyond the face of the gauge.

**Pass:** A projection that does not extend beyond the face of the gauge passes.

**Fail:** A projection that extends beyond the face of any one of the gauges is considered a hazardous protrusion and should be eliminated.

See Clauses 12.3.1.3, 12.3.3.1, 12.3.3.2, 12.3.3.3, 12.4.2 and 12.4.4

### Head and Torso Entrapment Test

Any rigid opening that is not bounded by the ground may be a potential head entrapment hazard. An opening may present an entrapment hazard if the distance between the sides of the openings are greater than 88.9 mm (3.5 inches) but less than 228.6 mm (9 inches). Any dimensions within this range should be considered a potential of entrapment.

To test if a rigid opening is a concern for head or torso entrapment:

Use either the Head or Torso probe (Figures 3, 4, 5 and 6).

**Step 1:** identify all rigid openings

**Step 2:** Attempt to place the probe in the opening parallel to the plane of the opening. While keeping it parallel, rotate the probe to a different orientation and attempt to move the probe freely through the opening.

**Step 3:** If it doesn't freely pass through, it's a **FAIL**. If it passes freely, it's a **PASS**.

(Head probe will not need to be rotated but will still need to pass through the opening freely.)

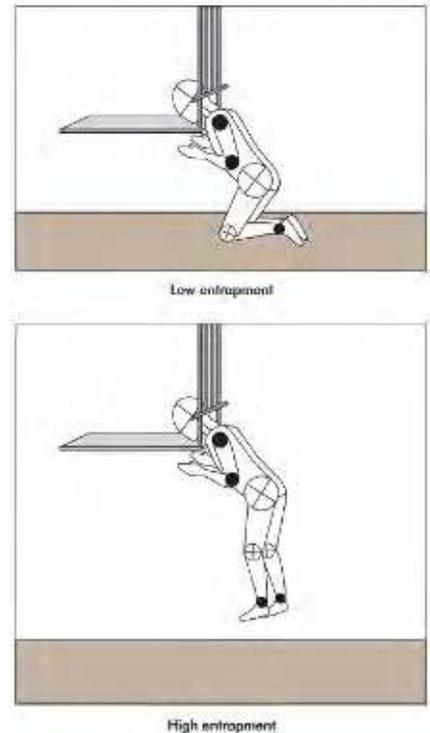


Fig. 3



Fig. 4



Fig. 5



Fig. 6

## Slide Toggle Test Procedures

To minimize the likelihood of clothing, or hair, entanglement on slides, use a slide toggle device.

**Step 1:** Grasp the cord near the toggle. Position the toggle above or adjacent to the point to be tested. With the toggle at rest, release the cord allowing the toggle to drop vertically (under the influence of its own weight) at the point to be tested. Grasping the toggle and/or swinging the cord is not permitted.

**Step 2:** With the toggle at rest, move the test device slowly (at an approximate rate of 150 mm/sec or 5.91 in/sec) in the intended direction of travel of the user. Do not apply any additional initial force to wedge the toggle or cord into any opening.

**Step 3:** Test all positions within the range of the test device. Move the test device slowly in the direction of expected movement. Ensure the pole of the test device remains in the vertical position and the application of both the toggle and cord is influenced solely by its own weight. Ensure no additional initial force or influence is applied to wedge the toggle or the cord into any opening.

**Step 4:** If the test device is obstructed, apply a maximum force of 50 N (11.24 lbs) for a period of up to 10 seconds in the direction of the expected movement of the user. If the applied force causes the obstructed test device to release from the test location, that location passes the test.

**Step 5:** Test all potential entanglement locations twice. If a failure (i.e., obstruction that cannot be released per Step 4), occurs during one of two tests at the same location, the location fails the test. Record all failures and report for corrective action.



Slide toggle test device



protrusion gauges

## Cleaning

Chances are if a playground is teeming with children, it's also teeming with germs. After all, before children touch play equipment (and one another), kids have been known to sneeze with abandon and wipe their noses with their hands. Handwashing after using the bathroom may prove too time-consuming to a child who wants to get back to the playground and have fun. And toddlers clad in leaky diapers may sit on spring toys, slides, or swings. The end result: Many playgrounds contain some pretty nasty types of germs.

**In most outdoor playspaces, the play equipment is cleaned infrequently, if at all.** Most playground owner/operators count on Mother Nature to do the cleaning. And for the most part, Mother Nature does a good job. However, there are still plenty of germs at an outdoor playground. Nasty germs can spread across the playground, as small hands grasp the swing chain, use the hand-grips at the monkey bars, and push off from the slide. It turns out, the playground may be many times more germ-infested than virtually any surface in your home. In addition to the germs already at the playground, already sick children also in attendance at the local park can present even more of a health threat to a child.

### **So how can we sanitize outdoor public playgrounds to a reasonable level?**

Read playground manufacturers instruction manual first. The playground owners' manual and instructions are a great place to start. These should have come with your play equipment upon initial installation and should be the best source of information on how to clean the structures, including which detergents and cleaning methods to use or avoid. The owners' manual can be a treasure trove of information on how to maintain your playground and prolong its longevity. Too often these manuals get lost or overlooked. How to sanitize your play equipment may be one of many tidbits of useful information inside.

### **Below is a normal course of action for sanitizing and cleaning playground equipment:**

- Start by using a power washer on metals and plastics (be sure to start on the lowest / least powerful setting to help ensure no damage to the equipment). PVC coated platforms can also be power washed, albeit you will need to pay special attention to any cracks in the PVC coating to avoid lifting, peeling, or spreading of these areas which can leading to a larger maintenance problem down the road.
- A low pressure sprayer may be more optimal than a power washer.
- Harsh chemicals like bleach or chlorine should never be used to clean playground equipment. If you have used any chemicals, leave the play equipment closed for a minimum of 24 hours to allow contaminants and contagions time to dissipate.
- If you need to use chemicals, ensure they are approved for use.
- Make sure any staff operating a washer or sprayer have Personal Protective Equipment (PPE) to avoid contaminated water droplets.
- Wood cannot or should not be power washed as it can become abrasive and the water pressure can cause damage to wood surfaces. On wood, use a brush with warm soapy water. Also use warm soapy water on anything sticky. All playground surfaces can be wiped clean with a disinfecting wipe or brush with warm soapy water.  
Please note: a misconception is that you need to use hot water. Water of any temperature is sufficient.
- Degreasers should not be used to clean plastics, bubble panels or any type of window as it can cloud up and inhibit visibility and can permanently damage these materials.
- Wipe down the most commonly used areas such as handrails, climber rungs, etc. with a damp cloth and a mild detergent.
- Soft bristle brushes can be used to get rid of dirt on plastics, get into crevices and to clean ropes.
- Synthetic poured-in-place surfacing: use vacuum or blower as a good cleaning practice, but recognize this will likely have no effect on any germs or coronavirus. Do not use a power washer as it can cause damage to the surface. Consult the manufacturer (or owner's manual) about what types of cleaning agents may be used to sanitize the surface.
- Loose fill surfacing such as sand can be cleaned with a sifter and potentially a mild detergent.
- Engineered wood fibres: A mixture of 3 parts water to 1 part liquid laundry detergent has been demonstrated in the past to help remove and/or eliminate surface microbial growth such as nuisance molds and mushroom growth.
- Consider leaving hand sanitizer station(s) at your playspaces along with instructions signage to apply before and after each use in accordance with local health regulations or instructions on the manufacturers label. Maintain a record on file of what has been done by maintenance staff in this regard and inspection and replace these sanitizers when appropriate.

## Other steps to consider

- Have enough trash receptacles on site: If you make it easier for people to keep things tidy, you will have less to clean yourself. Also, keep these trash receptacles outside the playground surfacing, and at an acceptable distance (not too far away or they will not get used, not so close they interfere with play or create an opportunity for germ transfer to the play area). Make sure trash receptacles are attached to something (in-ground or chained up to avoid tipping or moving, but allow maintenance).
- Keep snack areas separate from play areas: By creating a separate area for snacking and placing washrooms or port-a-potties nearby, as well as hand sanitizing stations nearby, you can maintain a food-free play area.
- During summer, the UV rays from the sun will help start to kill any germs that may be present on play equipment.

## In the event you need to close down a playstructure

At times, there may be a need to close off and provide some kind of 1.8-meter or 6 foot high temporary fence to prevent use of playgrounds or playground components. Further, if there was a component that presented a hazard to public use, you would likely need to remove that component entirely. If you find a need to rope off the playground, use caution tape or temporary fencing etc., often in conjunction with signage, to “close” your playgrounds.

- Keep your signage independent whenever possible (not attached to the equipment, by attaching the signage to the equipment one can create a non-compliance such as an entrapment, sharp edge, etc.).
- Keep your signage out of the protective surfacing zones (but readily identifiable and visible to anyone that may attempt to use the equipment).
- If you must attach signage to the equipment, ensure no secondary hazard such as sharp edge, entrapment, entanglement, etc. is created by the sign or the distance between the signage and existing equipment leaves a compliant protective surfacing zone. Sign material should be flexible and can break with pressure. Zip ties can be used but make sure the are cut end is flush with the latching mechanism to avoid sharp edge).
- Post signs at all access points into the play area (if there are 4 walkways into a play area, there should be 4 signs).
- Putting signage on swings may be difficult.
- Wrapping the swings around the swing frame top rail and fixing them into position with zip ties would make the swings un-useable.
- Use a warning symbol as it warns of all hazards and are a general caution.



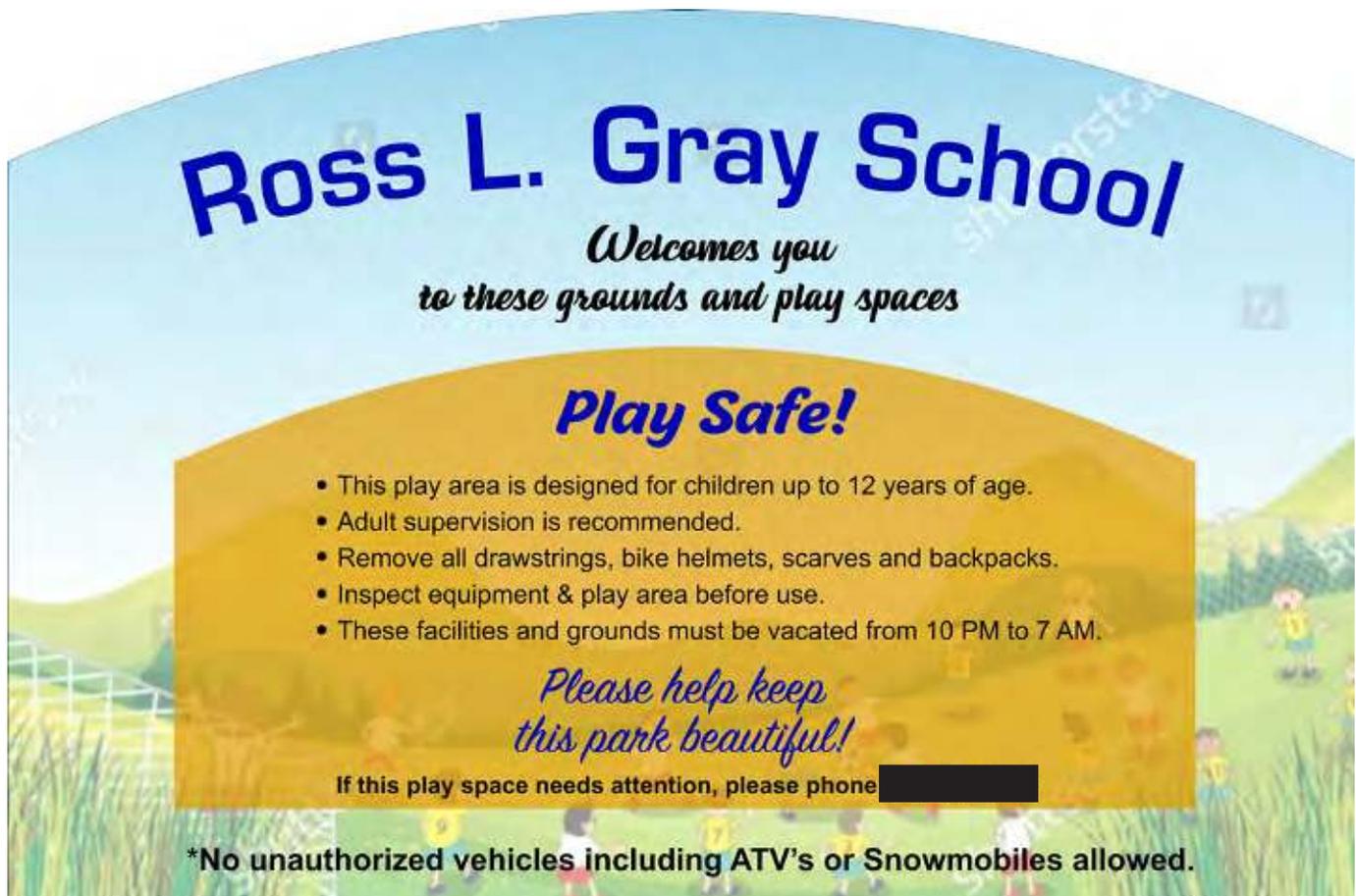
## Types of methods and concerns for closure:

- Roped off – Which could create a looping or suspended hazard for clotheslining a user and would make the equipment non-compliant.
- Social media posts as a sole means of informing the public - Many do not have access to social media and seems equivalent to lip service with no real substance.
- Signage attached to equipment – potential to create entrapment openings because of the new signage.
- Caution tape – Don’t just place caution tape around some components, they should be around all of them. Be aware that this could mean some components are still open, while others are not open which is a confusing message.
- Fencing and/or other physical barriers – ensure they’re safe in the case of kids trying to climb over.

## Useful playground signage language

Consider signage. Every playspace installed in Canada since 2003 has required schools to identify their name and contact information in each playspace to comply with CSA Z614 Clause 16.1 for owner/operator identification signage. Many school playgrounds use this owner/operator signage to convey more information than just the schools' name and contact information. This signage often includes information such as:

- Adult supervision is recommended.
- Hours of use (for bylaw enforcement).
- Inspect play area before using the equipment.
- No running, pushing, or shoving.
- Do not use equipment when wet/snowy conditions exist.
- Use proper footwear.
- No bicycle, roller blade or skateboard use in the play area.
- Do not wear bicycle helmets while on play equipment.
- No pets allowed.
- Playground equipment is not to be used when ground is frozen.
- **Thoroughly clean hands before and after each use.**
- Dial 9-1-1 in case of emergency.
- If you have any concerns about this play area please call XXX-XXX-XXXX.
- We appreciate your co-operation, please play safely.



**\*No unauthorized vehicles including ATV's or Snowmobiles allowed.**

## **Materials**

### **General Requirements**

Playground equipment shall be manufactured and constructed only of materials that have a demonstrated record of durability in the playground or similar outdoor setting.

### **Metals**

Metals shall be painted, galvanized or otherwise treated to prevent rust.

### **Coatings**

All paints or other finishes shall be non-toxic with documentation from the manufacturer stating that this treatment will not present a hazard to the user.

### **Wood**

Wood shall be naturally rot and insect resistant or treated to avoid such deterioration. Creosote, pentachlorophenol and tributyl tin oxide are too toxic and shall not be used as preservatives for playground equipment. Technology exists that will minimize the amount of leachable chemicals on the surface of the wood after treatment. **School maintenance should request the safety data sheets from the manufacturer of the preservative to determine the safest material available.** Materials such as railway ties or hydro poles must not be used. If type of treatment on wood cannot be confirmed, do not use.

### **Plastics**

Plastics shall be strong and durable and able to maintain structural integrity under a wide range of temperature variation.

### **Ropes**

Ropes shall be strong and durable and resistant to U.V. deterioration.

### **Hazardous Substances**

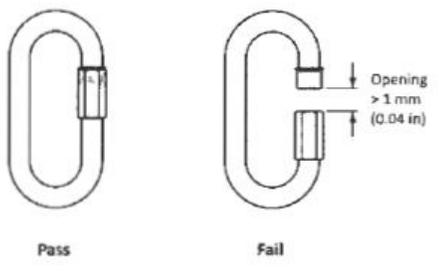
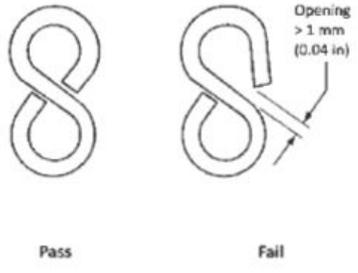
The manufacturer shall ensure that users of the playground equipment cannot ingest, inhale, or absorb any potentially hazardous amounts of substances as a result of contact with the equipment.

### **Fastening Devices**

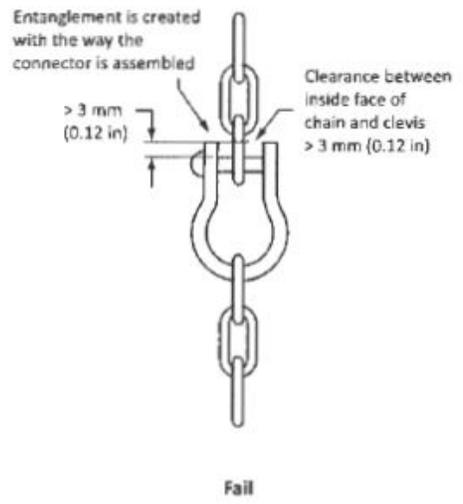
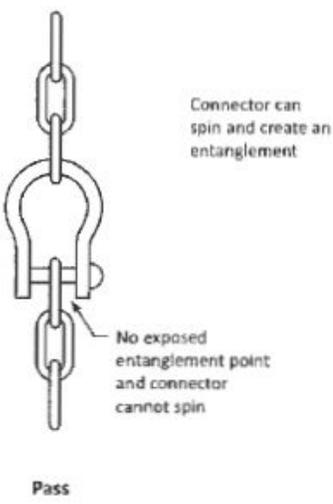
All fasteners shall be corrosion resistant. Bearings shall be easy to lubricate or be self lubricating. All hooks, including S-hooks, shall be closed as tightly as possible. S-hooks are being replaced with a new clevis style system which reduces the hazard.



**“S” Hooks & “C” Clamps**



**Clevis Hook**



## **Fasteners**

### **Corrosion Resistance**

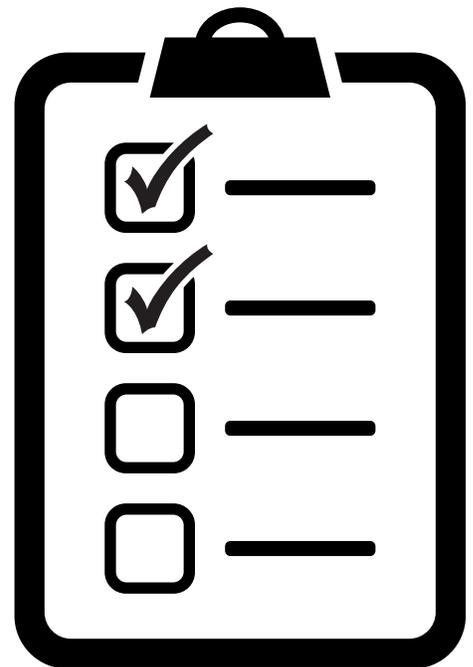
All fasteners and connecting or covering devices shall be inherently corrosion-resistant or be provided with a corrosion-resistant coating.

### **Anti-Tampering**

When installed in accordance with the manufacturer's instructions, fasteners and connecting and covering devices shall not loosen or be removable without the use of tools. Lock washers, self-locking nuts, or other locking means shall be provided for all nuts and bolts to protect them from detachment. Hardware in moving joints shall also be secured against unintentional loosening.

## **Public Playground Safety Checklist**

1. Make sure surfaces around playground equipment have at least 254-305 mm (10 to 12 inches) of wood chips, mulch, sand or pea gravel.  
Any protective surfacing mats shall be made of CSA approved material.
2. Check that protective surfacing extends at least 1.8 m (6 feet) in all directions from play equipment. For swings, be sure surfacing extends, in back and front, twice the length of the swing chain.
3. Make sure play structures more than 762 mm (30 inches) high are spaced at least 2.75 m (9 feet) apart (1.8 m (6 feet) for protective surfacing plus 1 m (3 feet) for shared encroachment).
4. Check for dangerous hardware, like open "S" hooks or protruding bolt ends.
5. Make sure spaces that could trap children, such as openings in guardrails or between ladder rungs, measure less than 89 mm or more than 229 mm (3.5 inches or more than 9 inches).
6. Check for sharp points or edges on equipment.
7. Look for tripping hazards, like exposed concrete footings, tree stumps or rocks.
8. Make sure elevated surfaces, like platforms and ramps, have guardrails or protective barriers to prevent falls.
9. Check playgrounds regularly to ensure equipment is in good condition and surfacing meets adequate depth and minimal compaction.
10. Adult supervision is highly recommended.
11. No bicycle helmets are allowed when using play structures.



## Winter Use Advisory

MSBA has been a long-time advocate of playground safety programs that include, but are not limited to, the provisions of the *CSA Standard CSA-Z614*, and any preceding Guidelines. Without detracting from the importance of following the CSA Standards for Playground Safety, we wish to emphasize that this Standard is intended to establish a **MINIMUM** code of conduct for any operator of public-use play structures.

One area of concern relates to equipment safety under winter conditions. MSBA Risk Management strongly recommends that play structures are not to be used during snowy or icy weather. In winter climates, there is no acceptable surface protection when the ground is frozen. Extreme caution must be used in winter conditions.

The following winter conditions can make equipment that is otherwise in compliance with *the Standard*, unsafe for use:

1. Freezing temperatures - At temperatures below 0 C, very few types of protective ground surfacing remain resilient enough to offer any degree of protection to a falling child - regardless of depth. If the ground cover is frozen, the play equipment is NOT safe for use.
2. Snow build-up - Snow can cause two problems on a play structure - firstly, it can make play surfaces very slippery; secondly, it can create suffocation hazards if the openings at the end of tubes, tunnels or similar structures become closed in by drifting snow.
3. Ice or freezing rain - As noted above, ice or freezing rain can make play surfaces, hand grips and stairways very slippery, increasing the risk of slip and fall injuries.
4. Clothing - Winter clothing may present a unique hazard. Synthetic materials, such as nylon, reduce sliding resistance, particularly on slide beds. This can increase the travel speed on this equipment to a dangerous level, and if combined with frozen ground cover, as described under Item (1), can increase the chance of injury.
5. Loose hanging accessories on winter clothing, such as scarves and drawstrings can become entangled in components of the equipment and should not be used on play structures.



## Daily/Weekly Inspection Form Manitoba Schools

School name: \_\_\_\_\_

Inspector Name: \_\_\_\_\_ Date: \_\_\_\_\_ Start time: \_\_\_\_\_

Repairer Name: \_\_\_\_\_ Date: \_\_\_\_\_ Start time: \_\_\_\_\_

Use the following codes: **1** = OK **2** = Needs maintenance **3** = Request for repair  
**O** = Supervisor notified and work order written **X** = Corrective action complete

General Inspection items	Code	Inspection comments	Repair comments
Vandalism: Damage, Graffiti, Glass, Trash, etc.			
Loose, Broken Or Missing Hardware (Loose Bolts, Missing End Caps And Cracks etc.)			
Chains (Kinked, Twisted, Broken)			
Components/Anchoring/Handrails – Secure (No Loosening)			
Swing Seats (Cuts, Cracked, Missing)			
Wood (Rotten, Cracked, Missing)			
Remove Foreign Objects (Ropes, Chains, Wood, etc.)			
Sweep Walkways, Platforms, Steps			
Footers (Concrete) Exposed			
Standing Water			
Objects In Surfacing Material (Hazardous Or Dangerous Debris)			
Rake Loose Surfacing Material Level			
Need Surfacing Material For Under:			
Swings			
Climbers			
Sliding Poles			
Slides			
Bee/Wasp Hive Infection			
Metals (Rusted/Corroded)			
Plastics (Cracked/ Stressed)			
Others			

For office use only

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Use back of form for additional comments.  
 Report all vandalism to principal and/or your maintenance supervisor.



## Monthly Inspection Form

Manitoba Schools

<b>Owner:</b>	
<b>Playground:</b>	
<b>Inspector:</b>	<b>Initial:</b>
<b>Date:</b>	<b>Time:</b>
<b>Repairer:</b>	<b>Initial:</b>
<b>Date:</b>	<b>Time:</b>
<b>Supervisor:</b>	<b>Initial:</b>
<b>Date:</b>	
<b>Site Conditions:</b>	
Vandalism: graffiti, glass, trash, damage	
_____	
Drainage: standing water	
_____	
Borders: damage, missing, protrusions	
_____	
Landscaping: damage, broken, missing	
_____	
Site amenities: tables, benches, grills	
_____	
Signage: broken, missing, damage	
_____	
Drinking fountain: broken, drainage	
_____	
Additional comments: (use back as needed)	
_____	
_____	
_____	
_____	
Work orders issued:	
_____	
_____	

## Monthly Inspection Form

Manitoba Schools

JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	Use the following codes: <b>1 = OK</b> <b>2 = Needs maintenance</b> <b>3 = Request for repair</b> <b>0 = Supervisor notified w/o written</b> <b>X = Corrective action complete</b>
												Logs/Boards: cracks, splinters, decay
												Seats/Slats: cracks, splinters, decay, rust, paint
												Platforms/Decks: loose, gaps, rust, protruding bolts
												Sharp edges: corners, edges, bolts, burrs, splinters
												Endcaps: missing, exposed piping, bees, wasps
												Bolts/Hardware: protruding loose, missing
												Welds: pitting, rust, cracks
												Paint: chipping, peeling, rust
												Footings: loose, exposed, cracked
												Support Posts: loose, protruding bolts, collars
												Bars/Pipes/Rails: loose, missing, protruding bolts
												Collars/Brackets: loose, missing, drive pins
												Rungs/Handholds: loose, protruding bolts
												Guardrails/Barriers: loose, missing, protruding bolts
												Ramps/Transfer Deck: access, gaps, surfacing
												Ladders/Steps: loose, rust, protruding bolts
												Overhead Eqpt: loose, vertical projections
												Sliding poles: loose, footings
												Talk tubes: bees, wasps
												Bedways/Tunnels: cracks, gaps, protruding bolts
												Suspension Bridge: gaps, protruding bolts, pinching
												Swing Seats: cracks, missing, replace
												S-hooks/Clevis: excessive wear, open, replace
												Chains/Ropes/Cables/Nets: loose, rust, wear
												Bearings/Fittings: grease, wear, replace
												Tires: damage, mounting, drainage
												Track Rides: track, hanger, bearings
												Springs: support, worn, replace
												Panels: loose, missing, damaged
												Balance Beams: hardware, surface
												Synthetic Surfacing: holes & depressions
												Mulch/Pea Gravel surfacing: depth, holes & depressions
												Sand Surfacing: remove debris, sweep walks
												Unwrap swings wrapped around top rail
												Check moving components for wear/tear
												Check condition of access to play area (paths, fencing)