

**Report of the
Playground Safety and ADA Audit
For the Billings Park Playground
Edinboro, P
November 2015**

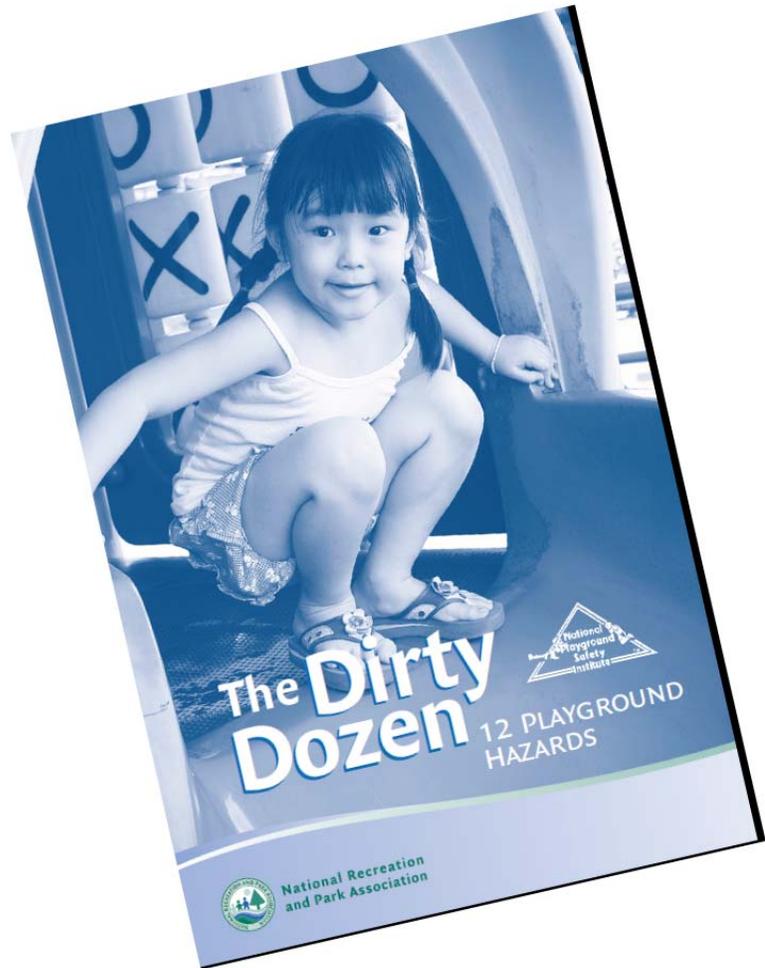


**Audit and Analysis conducted by
Pashek Associates
Community and Recreation Planners,
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The U. S. Consumer Product Safety Commission (CPSC) has long recognized the potential hazards that exist with the use of playground equipment, with over 200,000 estimated emergency room-treated injuries annually. The most recent study of 2,691 playground equipment-related incidents reported to the CPSC from 2001-2008 indicated that falls are the most common hazard pattern (44% of injuries) followed by equipment-related hazards, such as breakage, tip over, design, and assembly (23%). Other hazard patterns involved entrapment and colliding other children or stationary equipment. Playground-related deaths reported to the Commission involved entanglement of ropes, leashes, or clothing; falls; and impact from equipment tip over or structural failure.

The CPSC, along with the American Society for Testing and Materials (ASTM) have developed playground safety guidelines that have become the standards for the industry. While neither of these is adopted as law in Pennsylvania, they have been recognized in by consumer advocacy groups, the playground manufacturing industry, parks and recreation professional, and the legal systems in the Commonwealth as the accepted standard of care and protection.

The National Recreation and Park Association (NRPA) is a partner in supporting playground safety across the US. NRPA has developed two of the nation's most significant resources for playground safety. They are the Certified Playground Safety Inspector (CPSI) training and certification program and *The Dirty Dozen* guide to playground safety. Both initiatives have helped to train and inform professionals and the public on playground safety issues at the highest national standards--ensuring that children across the U.S. have access to safe, challenging, and fun play environments.



The inspection and audit of Edinboro's playgrounds has been completed by Certified Playground Safety Inspector with fourteen years of experience, and who has completed nearly 100 playground safety inspections.

In this report, *The Dirty Dozen* guide to playground safety is used as the outline to report the findings of the inspection of the Billings Park playground.

The Dirty Dozen and ADA Compliance

The National Recreation and Park Association (NRPA), through their playground safety awareness program has identified twelve of the most significant playground safety hazards. NRPA has identified them as “The Dirty Dozen.”

1. Improper safety surfacing
2. Inadequate use zones
3. Protrusion and entanglement hazards
4. Entrapment in openings
5. Insufficient spacing of equipment
6. Trip hazards
7. Lack of supervision
8. Age appropriate activities
9. Lack of maintenance
10. Crush, shear, and sharp edge hazards
11. Platforms with not guardrails
12. Equipment not recommended for public playgrounds

Through the inspections and audits of the playgrounds at Edinboro’s Billings, Robert Thompson, and Chestnut Street Parks, issues of concern were identified in a number of the Dirty Dozen Categories.

In addition to the playground safety issues, the inspection evaluate the Billings Park Playground for compliance with the 2010 accessibility and design standards as established by the United States Access Board, an independent federal agency whose primary mission is accessibility for people with disabilities..

This report identifies the most critical ADA and safety issues.

ADA Accessibility and Compliance

Ground Level Requirements Based on Elevated Play Components

The number and variety of ground-level play components required to be on an accessible route is also determined by the number of elevated components provided in the play area. The intent of this requirement is to provide a variety of experiences for individuals who choose to remain with their mobility aids, or choose not to transfer to elevated play components. If ramps provide access to at least 50 percent of the elevated play components - which must include at least three different play types - then additional ground-level components are not required. In the play area shown on page 14, the composite structure has four elevated play components (bubble panel, slide, steering wheel, and tic-tac-toe panel). According to the table, a minimum of one ground level play component must be provided, and a minimum of one different type. The spring rider or swing can be used to meet the “one of each type” requirement and can also be used to meet the minimum number determined by Table 240.2.1.2.

Number of elevated play components provided	Minimum number of ground-level play components required to be on accessible route	Minimum number of different types of ground-level play components required to be on accessible route
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1	Not applicable	Not applicable
2 to 4	1	1
5 to 7	2	2
8 to 10	3	3
11 to 13	4	3
14 to 16	5	3
17 to 19	6	3
20 to 22	7	4
23 to 25	8	4
More than 25	8 plus 1 for each additional 3 over 25, or fraction thereof	5

Elevated Play Components

At least 50 percent of the elevated play components must be on an accessible route.

Billings Park Playground Non-compliance with ADA Guidelines

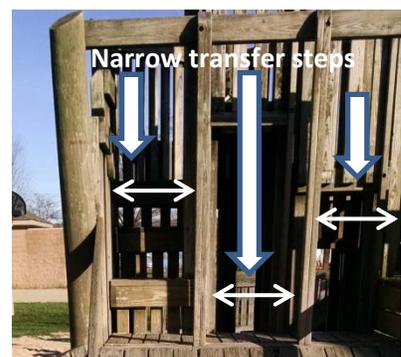
It is important to note that this playground is deficient in nearly every manner when evaluated against the 2010 ADA Guidelines. There is a mostly compliant accessible route located at the southwest corner of the play area. It leads from the entrance a series of platforms and decks, and two accessible play components. The ramp meets the minimum width and is within the maximum allowable slope but does not have appropriate hand rails.



Even if the ramp were brought into full compliance, the number of play components to which it leads is not sufficient for a playground of this size. As well, the ramp violates playground safety standards as it is located within the use zone of the adjacent play equipment.

As well, there is no accessible route from the street or parking lot to the ramp at the entrance to the play area. This means that a person with disabilities may not even be able to get to the playground entrance.

Where the ramp meets the accessible platforms and decks,



accessibility to play components beyond there is via a series of small elevated platforms, many of which are smaller than the required to meet the ADA standards. The standards require that transfer platforms/steps from one component to another be a minimum of 24" wide and 14" deep. Many of the platforms in this playground are much smaller, some as narrow as 17" and many at only 20" wide. There is clearly inadequate maneuverability space on the elevated components of this equipment.

None of the other elevated play components or ground components or routes in the playground meets ADA standards.

The ground surface throughout the playground consists of a shallow depth of pea gravel, which is not an ADA compliant surface. And even if the surface were compliant, few of the play components, ground or elevated, would be accessible for persons with disabilities; surely not enough to meet the standards defined in Table 240.2.1.2.

It would be extremely difficult and costly to bring the existing play area into compliance with ADA standards.

A full summary of ADA guidelines for playgrounds is located at the end of this report.

Billings Park Playground

For purposes of identification, the photo below depicts the playground in three sections. The following narrative will refer to certain components, issues, and/or concerns by identifying the general section in which they are located.

The Billings Park playground is designed and manufactured by Leathers and Associates. It was installed in 1991 through volunteer efforts of the Edinboro community. The playground has been well cared for over the years. However, safety and ADA standards have changed dramatically in the last 25 years. This Playground Safety Audit is intended to provide the Borough with a clear, objective analysis concerning its current compliance with these standards and its overarching concern for the safety and accessibility of the residents of Edinboro.



The purpose of compliance with current safety standards is to reduce the number and severity of life threatening and seriously debilitating injuries.

Using the Dirty Dozen list as a guideline, the following will identify specific hazards.

1. Improper Safety Surfacing

The surface or ground under and around the playground equipment should be soft enough to cushion a fall. A fall onto one of these hard surfaces could be life threatening and there are many surfaces that offer protection from falls.

Acceptable Surfaces:

- Engineered Wood Fiber*
- Wood Chips
- Sand / Pea Gravel
- Synthetic / Rubber Tiles*
- Shredded Rubber Mats*
- Poured-in-place rubber*

Unacceptable Surfaces:

- Concrete
- Blacktop
- Packed Earth
- Grass

*Can be applied to meet current ADA access standards

Most loose-fill surfacing must be maintained at a depth of 12 inches and be free of standing water and debris.*

Falls are the most common cause of injury on public playgrounds. The use of appropriate and adequate safety surfacing is the best protection against injury from such falls.

Inadequate and insufficient safety surfacing is among the top three hazards of the Billings Park Playground!

While pea gravel is an acceptable protective safety surface, it requires a minimum of 12" of pea gravel across the entire use zone of the playground. Less than three inches of pea gravel can be found in most places on this playground.

As well, pea gravel does not meet ADA guidelines for ensuring that the playground is accessible to those with certain disabilities.

In 1991 when this playground was installed, the importance of safety surface and the demand for inclusivity of use was not as well recognized as it is today. As a result appropriate safety surfacing was not required at the same levels as it is now. **It is critical that the safety surface be brought in to compliance with the most current standards.**

Unfortunately, because of the magnitude and complexity of this playground it would be exorbitantly expensive to remove and replace the pea gravel with one of the surfaces that will meet both safety and ADA standards.

To try to replace the existing surface without replacing the entire playground would require extensive manual excavation to dig to a minimum of 12" and replace all of the safety surfacing to an appropriate level. The specific depth of the safety surface will be determined by the type and height of the play equipment being used. And, as you will see in reading the remainder of this report, much of the existing equipment needs to be replaced as well.

The photos below offer a glimpse of the magnitude of the amount of safety surfacing and the extensive nature of poles and equipment where the surface needs to be replaced. This is not a project that can be only partially done. The entire surface must be replaced.



2. Inadequate Use Zones

A use zone is the area under and around playground equipment where a child might fall. A use zone should be covered with protective surfacing material and extend a minimum of six feet in all directions from the edge of stationary play equipment, such as climbers and chin-up bars.

Slide Use Zone

- For slides six feet or less in height, the use zone at the bottom of the exit area should extend a minimum of six feet from the end of the slide.
- For slides between six feet and eight feet high, the use zone at the exit of the slide is equal to the height of the platform or entrance to the slide.
- The maximum exit use zone, regardless of height, is eight feet. School-Age Belt

Swing Use Zone

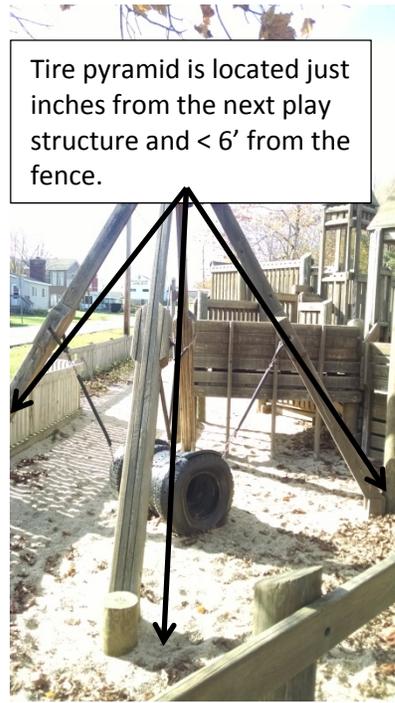
- Swings require a much greater area for the use zone.
- The use zone should extend two times the height of the pivot or swing hanger in front of, and behind the swing's seats.
- The use zone should also extend six feet to the side of the support structure.

Tot Swing Use Zone

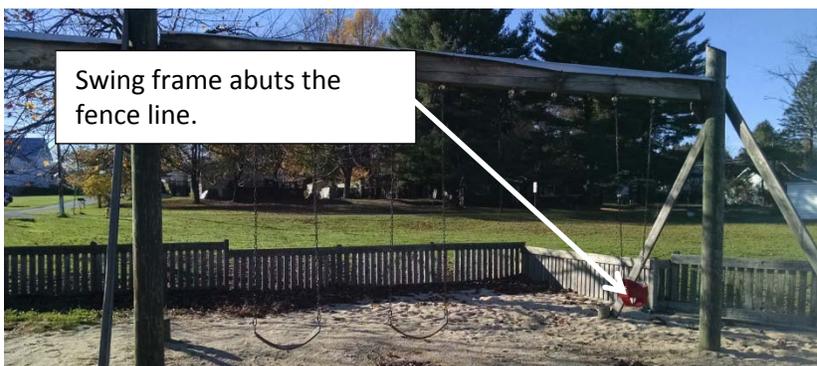
- A fully enclosed tot swing requires less of a use zone than school-age swings.
- Measure the vertical distance from the bottom of the seat to the pivot point or swing hanger and multiply by two for the use zone in front and back of the swings.

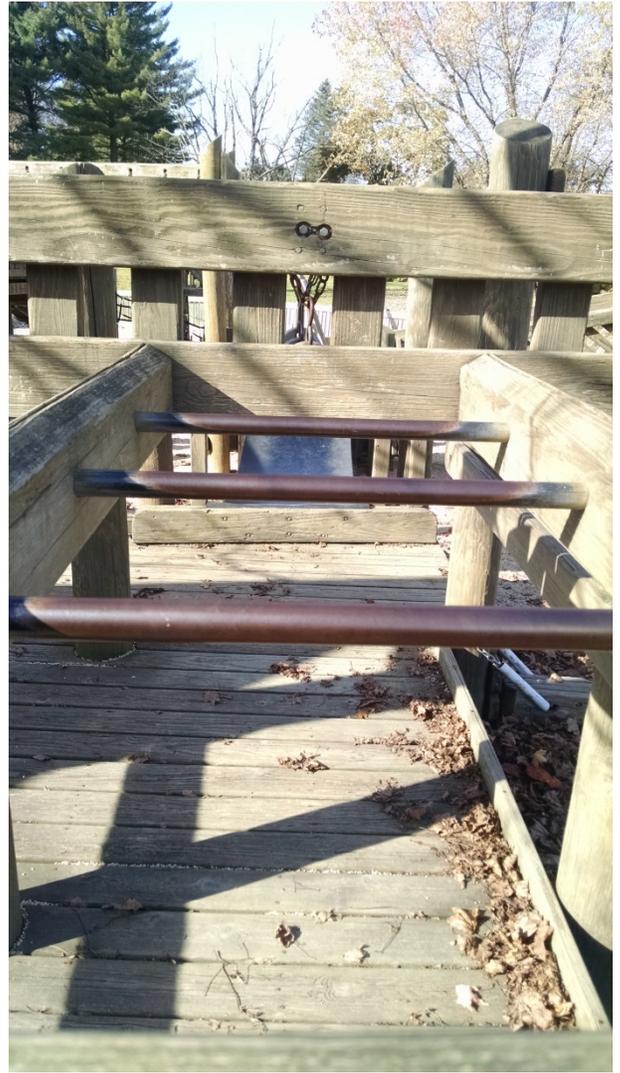


General deficiencies of the use zone



There are as many as 30 instances of inadequate use zones. Most cannot be repaired without removal of equipment, relocation of the fence, or removal of multiple pieces of equipment.





No safety surface under rings or horizontal ladder.

3. Entanglement and Protrusion Hazards

A protrusion hazard is a component or piece of hardware that is capable of impaling or cutting a child, if a child should fall against the hazard. Some protrusions are also capable of catching strings or items of clothing worn around a child's neck. This type of entanglement is especially hazardous because it might result in strangulation.

Examples of protrusion and entanglement hazards include:

- Bolt ends that extend more than two threads beyond the face of the nut
- Hardware configurations that form a hook or leave a gap or space between components
- Open "S" type hooks
- Rungs or handholds that protrude outward from a support structure may be capable of penetrating the eye socket.

Also, special attention should be paid to the area at the top of slides and sliding devices. Protruding hardware and some gaps may act as a hook and catch clothing. Ropes should be anchored securely at both ends and not be capable of forming a loop or a noose.

It is important to note that ALL slides in this playground have gaps between the top on the slide and the frame of the equipment. In most cases, these gaps are entanglement hazards where a string from a hoodie, a hood, or other item of clothing could become entangled, drawing the clothing around a child's neck and creating a potential strangulation hazard.

As well, several improperly closed "S" hooks were found that also create a similar strangulation hazard. These should be repaired or replaced immediately.

The following photos depict such gaps on various slides as well as "S" hook concerns.



All of these gaps are found on the spiral slide in section 1.

North slide in playground section 2



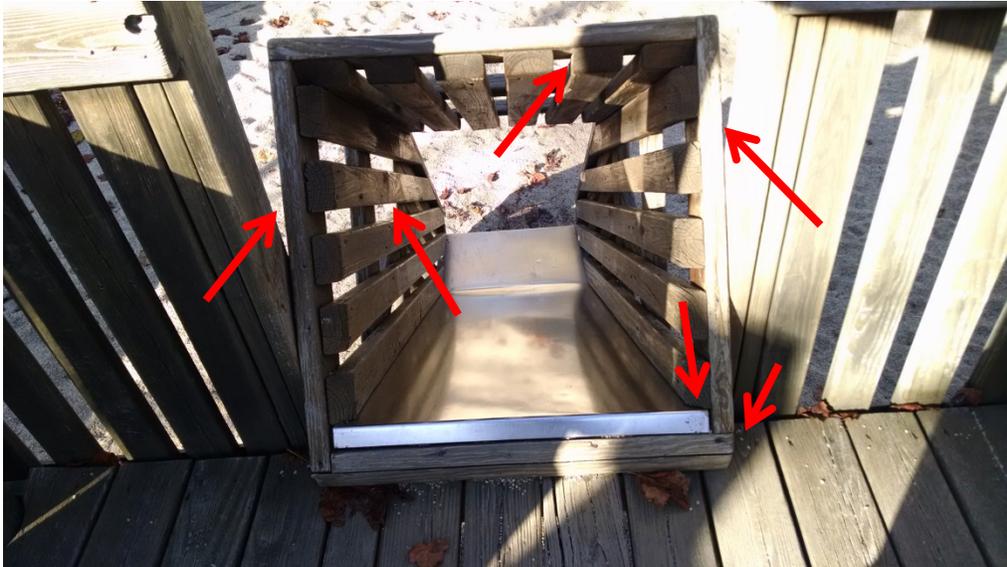
Entanglement hazard gap between the frame and the slide



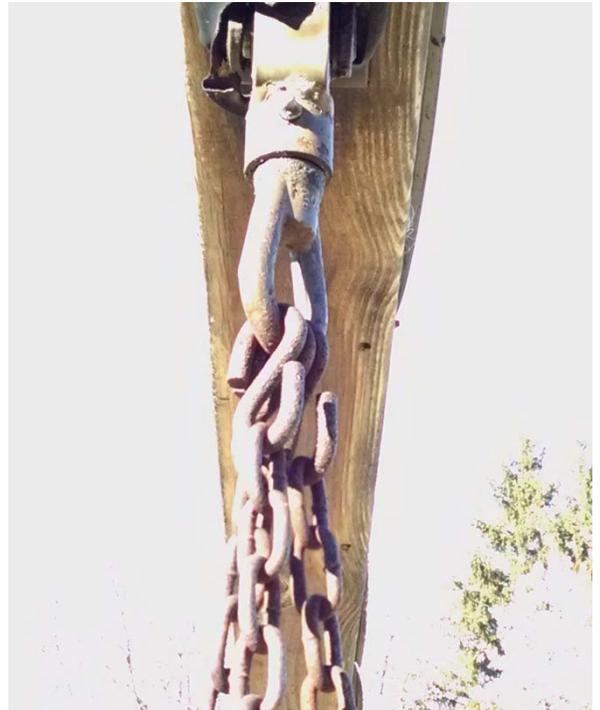
Edging added by owner creates an entanglement hazard

Potential head injury from protruding bolt

North slide on section 3 – Plenty of entanglement hazards



Entanglement hazard – “S” hook



“S” hook and nail entanglement hazards on swing set. Similar “S” hook issue on tire swing



Checking and repairing "s" hook issues.

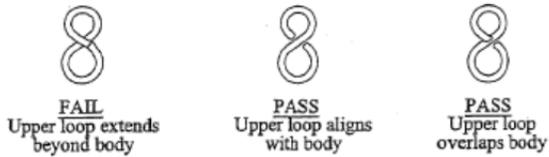
1. Checking Loops for 0.04in. (1.0mm) gap



2. Both loops closed. Checking lower loop projection



3. Both loops closed. Lower loop projection O.K. Checking upper loop



4. Both loops closed. Lower loop projection O.K. Upper loop O.K. Checking lower loop alignment

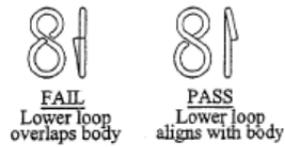


FIG. A1.18 Requirements for Fastening Devices
Reference Paragraphs 6.4.5 and 6.4.5.1

Other Safety Concerns base on Individual Component Types

Slides – Section 1

Short drop slide

1. See previous section describing entanglement hazards on this slide.
2. Metal surfaces are susceptible to extreme heat with possibility to burn a user's legs.
3. No enclosure at the slide entrance to funnel the user to a seated position.
4. Use zone does not extend at least 6' from the side and ends of the slide. Too close to the nearby bench.
5. Wooden side rails create a significant potential for splinters in the users hands and legs.



Spiral slide

1. See previous section describing entanglement hazards on this slide.
2. Non-compliant with the requirement of an obstacle free zone which extend upward and to the sides of all slides. Support pole is within the require 21".
3. Slide bed has entanglement hazard gaps in the bed, surface cracking, and rusted bolts.



Slide – Section 2

Large drop slide

1. See previous section describing entanglement hazards on this slide.
2. Metal surfaces are susceptible to extreme heat with possibility to burn a user's legs.
3. No enclosure at the slide entrance to funnel the user to a seated position.
4. Inadequate barrier at top of slide.
5. Plastic molding strips that have been inserted between the slide bed and side rails creates an entanglement hazard. If it has been installed by the Borough, they would be liable for any injury suffered as a result.
6. Wooden side rails create a significant potential for splinters in the users hands and legs.



Slide – Section 3

Wood Enclosed Slide

1. See previous section describing entanglement hazards on this slide.
2. Metal surface susceptible to extreme heat with possibility to burn a user's legs.
3. Wooden side rails and enclosure create a significant potential for splinters in the users hands and legs.
4. Wooden frame exposes the user to many opportunities to get hands, hair, and clothing caught between the wood slats. Because it is not a tube slide, all wooden sides and top would be within the 21" obstacle free zone for all slides.
5. There is a separation between two sections of the slide bed near the bottom, creating a potential shear or entanglement hazard.



Climbing and Upper Body Equipment

1. Sliding poles are not compliant with height standards.
2. Climbing and bars and overhead rings are not permitted to be located within the interior of the structure

Decks, Platforms, Stairs and Ladders

1. In many places the wood is deteriorating and splintering.
2. Insufficient hand rails on stairs and ladders.

Swings

1. See entrapment and use zone infractions described in items 1, 2, and 3 of this report.
2. Enclosed infant swings cannot be located in the same bay as standard belt swings.
3. Only two swings are permitted in each bay. There are three on this swing set.
4. Borough installed modification on the top crossbar put the liability for accidents or injuries on the Borough.
5. Insufficient space between the tire swing and the frame. 122' is required; 100" is actual.

General Deficiencies

1. While maintenance does not seem to be a detrimental issue, many of the components of the playground are deteriorating. Some wooden decks and posts show signs of rot; gaps are evident in some slide surfaces; the spiral slide has spider cracking on the bed frame; metal components show signs of rust.
2. The Borough has made modifications to a number of play components that likely do not hold to the manufacturer's specifications. These modifications may open the Borough to additional liability exposure should an injury occur that is related to one of the modifications. These include
 - Replacement of wooden support boards on the swing frames;
 - Covering the top rail of the swing with a plastic encasement where the nails used to hold the covering in place are protruding;
 - Installation of a plastic molding along the edge of one of the slides that creates a potential entanglement hazard.
3. Across the entire playground, the slope of the use zone, dropping downward from south to north, makes it difficult to hold the safety surfacing in place. The pea gravel has a tendency to migrate toward the lower end of the playground leaving higher areas with little safety surfacing.
4. Pea gravel is not an ADA compliant surface.
5. Existing signage does not meet the requirements of the safety standards. Signage must include:
 - The appropriate age group for the type of equipment that is installed (ages 5 –12)
 - Rules for playground use
 - Hours the play area is open
 - Emergency contact information and phone numbers
 - Caution signs must be located on surrounding roads informing drivers of the nearby playground.
6. There should be a clear and distinct separation between play equipment intended for children ages 2- 5 and those age 5-12.

Conclusions based on audit and analysis of the Billings Park Playground

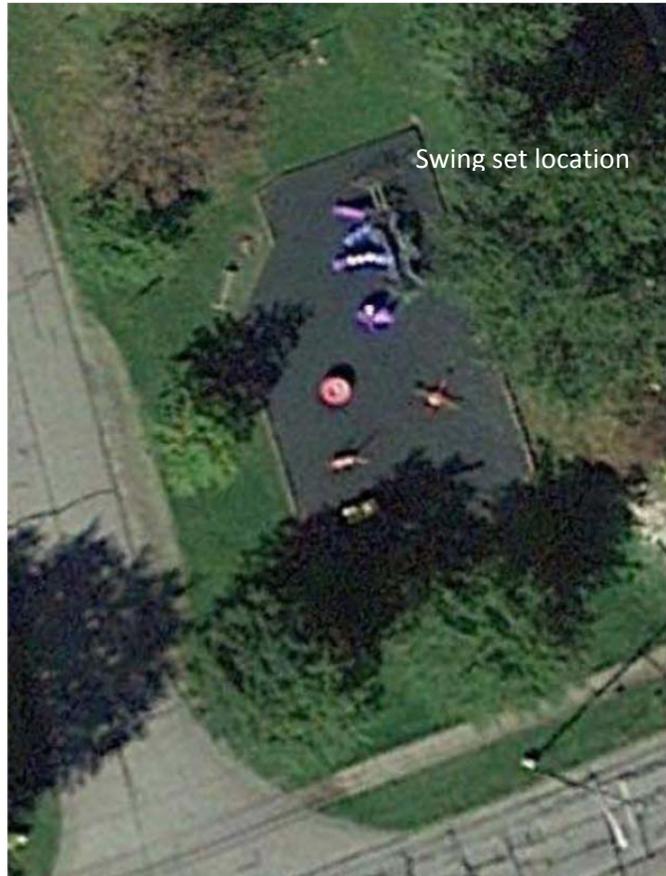
There are significant and critical safety issues particularly in the issues of protective surfacing, in adequate use zones, and entanglement hazards. As well, the playground is extremely out of compliance with the 2010 ADA Guidelines. To not make corrections to the issues identified in this analysis leaves a significant concern for the safety of the users of this playground and for the liability of the Borough. In evaluating the correction of these issues from the points of community safety, legal compliance, and cost effectiveness, the best result would be for the removal and replacement of the entire playground.

*Descriptions of “The Dirty Dozen” are taken from “The Dirty Dozen” brochure, published by the National Recreation and Park Association.

Chestnut Street Park Playground

This park is located in a residential area of Edinboro at the corner of Chestnut Street and North Skytop Road. In a brief visit to this playground, it was noted that the swing set, which is located immediately north of the main play area had several very obvious and significant safety deficiencies.

1. There was no safety surface under and around the swing set. As is noted on page 7 of this report, improper protective surface is the number one concern identified in *The Dirty Dozen* list of unsafe conditions.
2. The S hooks that join the swing chain to the top bar were not installed and/or closed properly, creating an entanglement/strangulation hazard for children using the equipment.
3. Over time, the top crossbar of the swings had weakened creating an a hazard to users. An attempted to repair the weakened bar was made by installing a 4"x4" wooden beam across the top of the bar. While this may have strengthened the bar, it created an additional liability to the Borough since it was not in compliance with the manufacturer's specifications for the swings.
4. Upside down U bolts were used to mount the wooden beam to the crossbar. When this was done, the U bolts protruded upward creating an additional entanglement or strangulation hazard at that location.



Based on the recommendation of the CPSI, that piece of equipment has already been removed from service.

Robert Thompson Park

The playground located at this park is a small Gametime structure with a wooden climber and a separate swing set. There are a number of safety concerns with this playground. It is part of a larger park that also includes tennis courts.

Safety Surfacing and Use Zone

There is no safety surfacing surrounding any of this equipment.

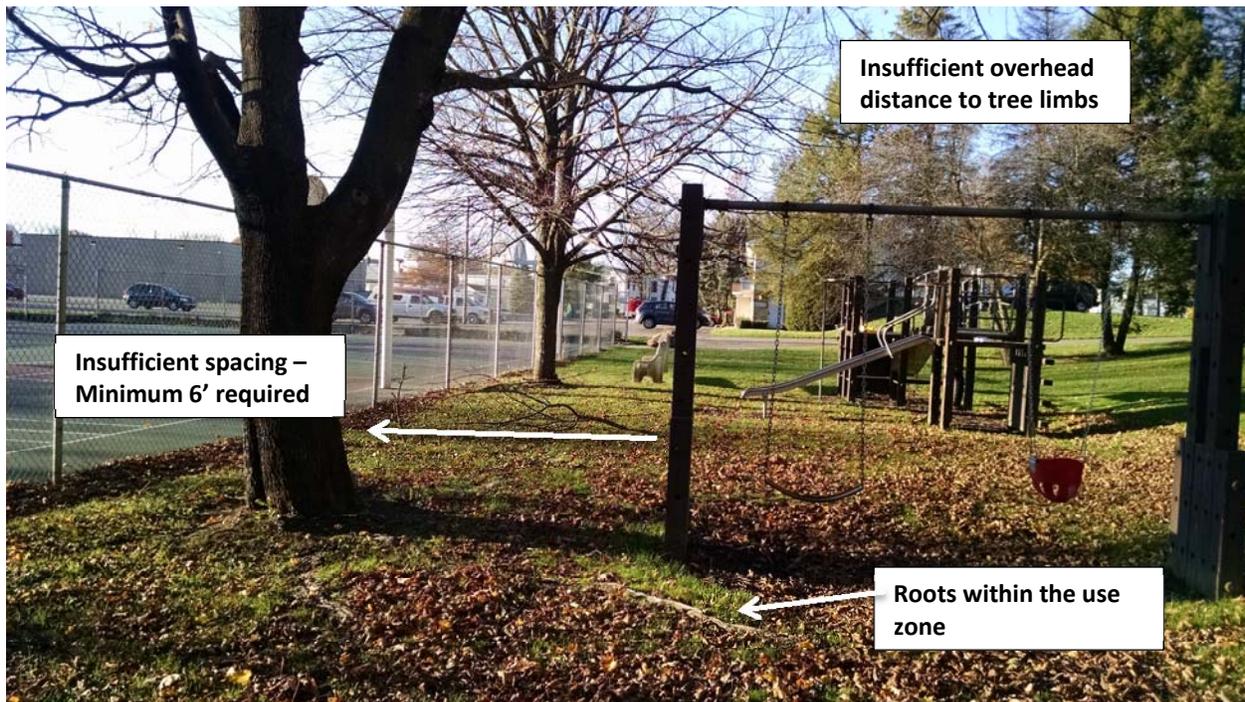
The entire surface underneath and around the equipment is grass and dirt. These are not acceptable surfaces for playground areas. A list of acceptable surface material can be found on page 7.

In addition to the lack of safety surface, there are exposed roots from a nearby tree within the use zone of the swing set. And the swings are located too close to the trees. Also, there are trees hanging within the overhead portion of the use zone.

Improper surfacing material under playground equipment is the leading cause of playground related injuries.

Over 79% of all accidents on playgrounds are from children falling

In order for the use zone to the upper side of the play unit to be compliant with safety surfacing, the hillside will likely need to be excavated to provide a fill 6' of use zone and surface. Though there is no adequate safety surface, the use zone on other sides are compliant with a minimum of 6' of space in all directions for the play set.





Entanglement, Strangulation, and Head Entrapment Hazards



Photos continued on next page



Other issues – see photos below

Slides

Slides cannot have any obstacle within 21” of the edge of the bed. The handles/bars in the photo are considered non-permitted obstacles



Sampling of Deteriorating decks and posts



Swings

1. Swing guidelines require that swings within the same by be of the same type – either belt swings of enclosed swings (see previous picture). And cannot be attached to composite structures.



ADA Compliance

This playground does not meet and of the current ADA standards or guidelines.

Conclusions based on audit and analysis of the Robert Thompson Playground

As with the Billings Park Playground, this playground has significant and critical safety issues particularly in the issues of protective surfacing, in adequate use zones, and entanglement hazards. As well, the playground is extremely out of compliance with the 2010 ADA Guidelines. To not make corrections to the issues identified in this analysis leaves a significant concern for the safety of the users of this playground and for the liability of the Borough.

In evaluating the correction of these issues from the points of community safety, legal compliance, and cost effectiveness, the best result would be for the removal and replacement of the entire playground.

PASHEK ASSOCIATES

LANDSCAPE ARCHITECTURE | DESIGN | PLANNING