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May 25, 2010

Mr. Ken Kutska
ASTM F15.29 Subcommittee Chair
100 Barr Harbor Drive
PO Box C700
W. Conshohocken, PA 19428-2959

Dear Mr. Kutska:

Thank you for the letter dated December 17, 2008, outlining the differences between the U.S. Consumer Product Safety Commission (CPSC) staff's *Handbook for Public Playground Safety* and the ASTM International (ASTM) public playground standards. CPSC staff appreciates the longstanding working relationship it has had with the ASTM F15 standards groups and the committees' desire to promote safer playgrounds for children.

The pages that follow present the CPSC staff response[1] to the points outlined in the October 3, 2008 letter from the International Play Equipment Manufacturers Association (IPEMA) to Mr. Hugh McLaurin. Mr. McLaurin has since retired, but staff from the Directorate for Engineering Sciences, including myself, Ms. Celestine Kiss, and Mr. Mark Kumagai, assisted in preparing these responses. Additionally, we have included a list of other modifications we are making to the May 2008 draft of publication #325, *Handbook for Public Playground Safety*. This response includes revisions made as a result of the meeting in St. Louis May 18, 2010.

Sincerely,

Hope E.J. Nesteruk

cc: Tim Ahern, President, International Play Equipment Manufacturers Association
Paul Giampavolo, F15 Chair
Len Morrissey, F15 Manager
William Foelsch, Chairman, National Playground Safety Institute
Karen Spears, Chairman, National Playground Contractors Association
Donna Thompson, Executive Director, National Program for Playground Safety

enclosures

[1] These comments are those of CPSC staff, have not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

Point-by-Point response

- **<u>Underlined</u> have been used for insertions and ~~strikethrough~~ for deletions.**

CPSC	ASTM	IPEMA Suggestion	CPSC Response
1.3 page 1 (These guidelines are not intended…) Equipment components intended solely for the disabled and modified to accommodate such users also are not covered by these guidelines.	1.5 page 1, This specification does not address accessibility, except as it pertains to safety issues not covered in the Americans with Disabilities Act Accessibility Guidelines (ADAAG).	CPSC change this statement. The current statement infers that equipment intended solely for children with disabilities may be exempt from the equipment safety requirements as outlined in the CPSC #325 Handbook. ASTM clearly states F1487 does not address ADAAG requirement, but does not require it to comply with requirements.	The Americans with Disabilities Act is covered by another governmental agency and is not under CPSC jurisdiction, and this wording is consistent with the previous version of publication #325. CPSC staff feels the difference between "not covered" in CPSC and "not addressed" in ASTM is syntax only. No change will be made.

1.6 Background, Page 2 - refers to toddlers as ages 6 months through 2 years, which would include children 35 months of age.	The Standard specifically addresses toddlers as those children who are under two years of age.	The age ranges be re-considered and reworded to include children under two years of age. The overlap of 12 months presents a problem when testing play areas. The under two standard for barriers is based on the center of gravity of the 23 month old. With the overlap would we be required to raise barriers to accommodate the 35 month old? This age range also contradicts statements elsewhere in the handbook such as Table 1 Age Appropriate Equipment, list equipment intended for children under two. The issues of overlap becomes a problem with equipment that is not recommended for a particular age group. If overlap, can the overall year child use the equipment? Track rides for example are not recommended for children 2-5. The ASTM standard says they are not recommended for children under the age of five. In States that have mandated compliance with CPSC this is a huge difference. The	ASTM F1487 recognizes that children's abilities overlap, and there is not a developmental cut-off at a child's 5th birthday. Similarly, the CPSC staff handbook extended this overlap to toddlers, too. The argument about equipment not recommended can be equally applied to the overlap at age 5 in F1487. Developmentally, this overlap is realistic and is likely to occur in playgrounds with unlimited access. However, the original intent in the first draft was for the recommendations for the toddler group to be congruent with ASTM F2373, Public Use Play Equipment for Children 6 months through 23 Months, and the test problems for toddler equipment are based on the ASTM standard and therefore the age range of 6-23 months. The definition of toddler will be changed to "Children 6 months through 23 months of age." CPSC staff does not feel that track rides are ever appropriate on playgrounds for preschool children (i.e., aged 2-5). This recommendation is consistent with past publications of the handbook, which has been mandated in several states. CPSC staff has not received comments from states indicating that this recommendation is an issue. The majority of children playing on such playgrounds would be in the "under 5" age group, and there is no realistic method of limiting access to children under 5 on a playground for children 2-5.

same is true for equipment not recommended for the pre-school age child. Can a five year old play on this equipment?

1.8, page 4 - Definitions - Projection - Hardware that extends outward from a surface of the playground equipment and must be tested to determine whether it is a protrusion or entanglement hazard, or both.	3, page 3 - Terminology - 3.1.26 projection - condition which, due to its physical nature, must be tested to the requirements of this standard to determine whether it is a protrusion or entanglement hazard, or both.	Change this definition to be consistent with ASTM. CPSC relates only to hardware. ASTM applies to all physical parts configurations including hardware.	Although neither document defines the word hardware, CPSC staff recognizes this term could be seen as limiting. This will be changed to read "Projection - Anything that extends…"
1.8, page 4 Definitions - Toddlers - Children 6 months through 2 years of age. 1.3 page 1, Indoor child care facilities should refer to ASTM F2373 for Children 6 months through 23 months.	F2373 does not define a "toddler," but notes that the Standard covers children through 23 months of age.	Change definition to be consistent with ASTM. F2373 covered both indoor and outdoor equipment for children 6 months through 23 months. CPSC should recognize this in the Handbook, as it provided more technical specifications. Adding the Toddler definition in the Handbook being 6 months through 2 years adds confusion for the intent of developing age appropriate equipment as outlined in ASTM F2373. Clearly the intent of F2373 was to define the user as under 24 months of age.	The information for toddlers was, for the most part, pulled from ASTM F2373; however, F2373 has different requirements for indoor supervised and indoor non-supervised environments. The information in this indoor supervised environment of the ASTM standard is beyond the scope and intent of this handbook, and CPSC staff felt it was best to refer those groups to the standard.

Page 4 - definitions. Protrusion — A projection which, when tested, is found to be a hazard having the potential to cause bodily injury to a user who impacts it, or whose clothing becomes entangled on it. Projection — Hardware that extends outward from a surface of the playground equipment and must be tested to determine whether it is a protrusion or entanglement hazard, or both. Entanglement — A condition in which the user's clothes or something around the user's neck becomes caught or entwined on a component of playground equipment. 3.2 Page 13, Entanglement and Impalement - the CPSC Handbook groups these two distinct hazards together. The first three points in the section pertain specifically to entanglement. Each of these hazards should be indentified separately and be consistent with ASTM.	The ASTM definition related to injury by impacting the projection. A protrusion hazard is a projection that fails the protrusion test method. Entanglement hazards are very different from protrusion hazards and the word entanglement should not be used in the definition of protrusion. It is a projection that has the potential to either impale or entangle. Refer to the definition in ASTM F1487.	The definitions be consistent with ASTM. The definitions in the Handbook are different than ASTM's definitions and are conflicting to consumers. For example, the use of the word "entangled" in the definition of protrusion conflicts with the definition of entanglement. Which definition do consumers and industry leaders use?	CPSC staff does not feel that using the word "entangled" in the definition of protrusion conflicts with the definition of entanglement and feels that ASTM's differentiation between projection (e.g., impalement or entanglement) and protrusion (e.g., impalement only) is arbitrary. Staff recognizes, however, that the definition of projection mentions both protrusions and entanglement and will, to prevent misinterpretation, remove "~~or whose clothing becomes entangled on it~~" from the definition of protrusion.

2.2.3 Conflicting Activities - The inclusion of use zones in this section is confusing. CPSC recommends that slide exits be in uncongested areas. "Uncongested" is not defined and this only adds to the interpretation issues of this section.	There is a clear difference between independent equipment and composite play structures and the different use zones for each.	Add to the 2nd paragraph the word "independent" so the Sentence would read "Different types of independent equipment have different use zones....." This would assist in clarifying the difference between independent equipment and composite play structures.	The last bullet and its sub bullet will be deleted; the information in the sub bullet will be moved to merry-go-rounds. The information on composite structures (last paragraph) will be made into a bullet and the following text added "… should be complementary. <u>For example, an access component should not be located in a slide exit zone."</u> Staff will re-write the section as follows : Different types of equipment have different use zones that must be maintained. The following are general recommendations for locating equipment within the playground site. Specific use zones for equipment are given in 5.3 • Moving equipment, such as swings and merry-go-rounds, should be located toward a corner, side, or edge of the play area while ensuring the appropriate use zones around the equipment are maintained. • Slides exits should be located in an uncongested area of the playground <u>so as not to interfere with play and traffic patterns and to minimize other children impacting the children exiting the slide.</u> ~~Use zones for moving equipment such as swings and merry – go-rounds and slide exits should not overlap the use zone or other equipment regardless of height. One exemption is for moving equipment where the diameter of the platform is less than 20 inches and the designated play surface of the adjacent equipment is less than 30 inches~~ • Composite play structures have become increasingly popular on public playgrounds. <u>Play and traffic patterns of children using</u> adjacent component on composite structures should be complementary. <u>For example, an access component should not be located in a slide exit zone.</u>

	2.2.4, Page 6 Sight Lines -It is important for parents and caregiver to be able to track the children as they move through the play environment, it is difficult to define "minimize as much as possible" and "equipment should be as visible as possible" from park benches.	This area is not addressed in ASTM standards.	Park Benches and attentive supervision are at odds with one another. Supervision and Visibility work together, as the child moves the supervisor/caregiver moves with them for the most impact. We suggest the Handbook highlight attentive supervision and remove supervision from park benches.	CPSC staff disagrees with the suggestion. Caregivers will find a place to sit, and it is better to have a bench near the playground than to not have one. The latter encourages caregivers to wander from the playground to find a seat and/or to sit on the ground where children may run into them and they will be slower to rise to their feet when needed.

2.3, Page 7, Selecting Equipment -The wording of this section is somewhat confusing and a change from the 97 Handbook and CPSC draft 2007 to the current 08 Handbook. In the previous versions, a more comprehensive list of equipment not recommended for specific age groups was included. Table 1 Age Appropriate Equipment Page 7, Toddler - Under 2 The age group Under 2 (6months To 23 months F2373) is in conflict with CPSC 1.8 Definition of Toddler -Children 6 months through 2 years of age. (35 months).	F2373 defined the age groups based on child development and child-care age separation.	It is recommended that CPSC consider using the information from the previous version of the Handbook as it relates to selecting equipment, or the information contained in the CPSC Handbook draft 2007, located on page 35.	CPSC staff recognizes child development, acknowledges that children develop at different rates, and there is no arbitrary cut-off at age 2 when it comes to play. Child-care centers are encouraged to look at F2373 in section 1.3, and this advice will be repeated under 2.2.2 with the addition of an Age Grouping section: "In areas where access to the playground is unlimited or enforced only by signage, playground designs should recognize that since child development is fluid, parents and caregivers may select a playground slightly above or slightly below their child's abilities, especially for children at or near the cut-off age (e.g., 2-years old and 5-years old). This could be for ease of supervising multiple children, misperceptions about the hazards a playground may pose to children of a different age, advanced development of a child, or other reasons. For this reason, the handbook considers these years to overlap between the groups. Playgrounds used primarily by children under the supervision of paid, trained professionals (e.g., child-care centers and schools) may wish to consider separating playgrounds by the facility's age groupings. For example, a child-care facility may wish to limit a playground to toddlers under 2 exclusively and can draw information from this guide and ASTM F2373. A school, on the other hand, may have no children under 4 attending, and can likewise plan appropriately. Those who inspect playgrounds should use the intended age group of the playground."

3.3.2 -Angles -CPSC is not consistent with ASTM when it comes to addressing partially bounded openings. Angles should be greater than 55 degrees, unless one side is horizontal or below horizontal.	F1487 specifies a test procedure to determine a partially bound opening and is more comprehensive than what is in the Handbook.	At the end of this section, simply refer to ASTM Standards for more detailed information related to determining partially bound openings.	At the request of the ASTM entanglement subtask group, CPSC did not include the partially-bound opening test and probe (fish-probe), as F15.29 was, at the time, balloting to replace the fish-probe with another partially-bound opening test. At the time of preparation of #325, it was not clear what test ASTM would use for partially-bound openings; therefore, CPSC staff used the 55 degree angle, which has been in every playground publication from CPSC. As of 2010, the partially-bound opening test has not been reworked or removed from F1487, and CPSC staff will include it in the testing appendix. This section will now read: Children can become entrapped by partially bound openings, such as those formed by two or more playground parts. (bullet) - Two accessible adjacent parts should not form angles less than 55 degrees, unless one side is horizontal or below horizontal. (bullet) - Use the partially-bound opening test in Appendix B to identify hazardous angles and other partially-bound openings. Note: Test procedure write-up is still in development and usability testing.
Section 3.4 -Remove "corners" from all references in the title and subsequent verbiage.	Corners are inherently covered as a sharp point or edge.	Removing "corners" from all references to be consistent with ASTM.	CPSC staff does not disagree that corners are also sharp points and edges; however, staff feels it is appropriate to list corners for completeness.
3.5 -Page 15, Suspended Hazards -This entire section is inconsistent with ASTM. CPSC speaks to a single suspended component. CPSC does not have the exemption for multiple suspended components that is found in ASTM 6.6.2.	In Section 6.6 of the ASTM Standard, suspended hazards are clearly defined and speak to multiple suspended components.	Clearly defining multiple suspended components. This section is confusing as it suggests that it is OK to have a suspended component within 45 degrees from the horizontal if it is not located in a high traffic area, is brightly colored and is anchored at both ends. '. The 08 Handbook expanded this section from	CPSC staff strongly disagrees that this "entire section is inconsistent with ASTM." Staff feels that the exemption in 6.6.2.1 is unnecessary since the handbook does not differentiate between single and multiple suspended components. The handbook treats all suspended components the same either way. The following changes will be made for clarification and readability: Children using a playground may be injured if they run into or trip over suspended components (such as cables, wires, ropes, or other flexible parts) hanging from one piece of the playground equipment to another or to the ground. These suspended components can become hazards when they are within 45 degrees of horizontal and are less than 7 feet above the protective surfacing. To avoid a suspended

		the 97 Handbook but failed to be consistent with ASTM.	hazard, suspended components: • Should be located away from high traffic areas. • Should either be brightly colored or contrast with the surrounding equipment and surfacing. • Should not be able to be looped back on themselves or other ropes, cables, or chains to create a circle with a 5 inch or grater perimeter. • Should be fastened at both ends unless they are 7 inches or less long or attached to a swing seat. These recommendations do not apply to swings, climbing nets, or if the suspended component is more than 7 feet above the protective surfacing and is a minimum of one inch at its widest cross-section dimension.
5.1.3, Page 19, Guardrails and Protective Barriers - Within this section, the requirement of having one rail of a horizontal guardrail placed overhead if the opening is greater than 15 inches is missing. In addition, there are no exceptions for stairways or ramps.	ASTM allows for the use of a single horizontal rail as an option for preventing an inadvertent fall. ASTM also includes exceptions to this requirement such as for upper body equipment because a user who is trying to land on a platform may not have the coordination or strength to pass their body through a 15 inch opening or small opening. The same exception applies to stairways, ramps and transfer systems. (See ASTM 7.5.5.2 for guardrails and ASTM	This conflict between CPSC and ASTM is major as it affects all existing designs since 1998 ASTM F1487 publication. We recommend that the same exceptions be included in the Handbook as are included within the ASTM standard.	CPSC staff does not feel there should be an exemption for stairways and ramps, and the ASTM committee appears to agree since it is currently balloting wording to include stairways and ramps. The first bullet will be reworded into two bullets: "(bullet) - Completely surround any elevated platform. (bullet) - Except for entrance and exit openings, the maximum clearance opening without a top horizontal guardrail should be 15 inches." Additionally, the first sentence of the last paragraph on page 19 will be modified to read "... provided on elevated platforms, walkways, landings, stairways, and transitional surfaces." CPSC staff feels that stairways are a walkway and a transitional surface, but will now specifically list them.

7.5.6.3 for protective barriers)

#325 1997 Handbook 5.3 (Age Separation of Equipment) list of components were specific, such as " free standing arch climbers", "free standing climbing events with Flexible components" etc. The list of components in the new Handbook draft is not as specific as in the previous version. This is a significant change and impacts a lot of equipment installed in the field and new playground designs. I believe we are all supportive of the 97 wording but not the 08 as it is restrictive and does not take into consideration Supervision and "playground should allow children to develop gradually and test their skills providing a series of graduated challenges", along with age appropriate playground designs accommodating these differences with respect to type, scale and layout. (CPSC 1.6)	To resolve this conflict, we suggest using the 97 Handbook and the 07 CPSC Handbook draft wording by inserting the words "free standing" before arch climbers and climbing events with flexible components into Section 5.3.	Although the comment is not clear, CPSC staff believes this comment refers to the statement in 5.3.2 "However, playgrounds designed for children under 4 years of age should avoid arch climbers, flexible climbers … upper body components." This statement will be removed; the recommendations are repeated elsewhere with the specific equipment types.

5.3.2, Page 24 -Climbing and Upper Body Equipment Last sentence states for the first time playgrounds designed for children under 4 years should avoid arch climbers, flexible climbers, horizontal ladders, parallel bars and other upper body components. This conflicts with Table 5, Preschool Arch Climbers/Flexible Climbers.	Consistency between Table 5 and Section 5.3.2	The change above addresses the conflict.
Section 5.3.2.1.5	Clarify that this requirement refers to vertical falls greater than 18", as this clarifies the original intent of this requirement.	The word "vertical" was removed from the 1997 publication to clarify the original intent, which was to prevent children from falling onto rigid bars and injuring internal organs. "Vertical" was often interpreted to mean only that two bars could not be directly above each other if there was more than 18" between them.

Section 5.3.2.3	8.2.5 3-Dimensional Climbing Net Structure (See figure xx.xx). 8.2.5.1 The mesh structure shall be arranged in a manner so there is no clear opening between flexible members with a vertical dimension greater than 72" and a diameter of 18" (457mm) for climbing nets intended for 2 through 5 year olds, and a diameter of 20" (510mm) for climbing nets intended for 5 through 12 year olds. See Figure xx.xx. 8.2.5.2 The fall height for 3-dimensional matrix nets shall be the highest distance of either the interior or exterior fall height. The minimum fall height for structures greater than 72" (1829mm) shall be 72". 8.2.5.2.1 The exterior fall height shall be the highest point at which a rigid vertical member contacts the climbing net structure when moved around the perimeter. See Figure xx.xx. 8.2.5.2.2 The	Add specific sections pertaining to 3-dimensional matrix nets per the requirements as defined in ASTM F1487-07 section 8.2.5. This prevents excessive freefall heights onto a flexible member. The clear opening diameters in each of the age groups is conservatively based upon the following anthropometric dimensions: shoulder width (8.66"-5% 2 year old, 9.72" -5% 5 year old), the lateral grip reach (18.9"-5% 2 year old, 20.67 -5% 5 year old). The lateral grip reach is measured from the opposite shoulder to the extended reach of the hand. If you considered the total lateral grip from hand to hand it would measure 29.14" -5% 2 year old, and 31.62" 5% 5year old. Typically users on nets of this style maintain three points of contact with the net at all times. If a fall to the interior occurred, the user would not fall directly through the net in such a manner that only shoulder width should be	CPSC staff has concerns about the virtually unlimited height allowed by the ASTM language on three-dimensional climbing net structures. As written, the manufacturer can build a climber that allows a child to climb to a height greater than the fall rating for the protective surfacing by layering the mesh so that there is no direct path to the ground. At the present time, CPSC staff does not have data to suggest this method will prevent life threatening or serious injuries, such as head injuries from falls to surfacing or internal injuries from impact with the net.

	interior fall height shall be the distance between the protective surfacing and the highest member where there is a vertical clear opening 18" (457mm) in diameter for climbing nets intended for 2 through 5 year olds, and a 20" (510mm) in diameter for climbing nets intended for 5 through 12 year olds. See Figure xx.xx.	considered. Therefore the lateral and wide spread grip ranges were also factored into the size of the opening. Note: The diameter requirements are more restrictive than that being proposed by the CEN. The 72" vertical dimension is consistent with interior clearance requirements being proposed by the CEN. Because of the posture (leaning inward/forward) maintained by users on climbing net structures, it is reasonable to assume that the height of an external fall would occur at the highest point on the exterior of the structure where the vertical member makes contact.	

5.3.2.4, page 27 Horizontal (overhead) ladders -States that the horizontal distance from the platform out to the first handhold should be at least 8 inches but no greater than 10 inches. The CPSC 1997 version stated the first handhold on either end of the upper body equipment should not be placed directly above the platform or climbing rung used for mount or dismount.	F 1487-07 (8.3.2) states - The horizontal distance from the leading edge of the take-off or landing structure, or both, out to the first handhold of upper body equipment shall be no greater than 10 inches. In addition, where the take-off or landing point is provided by means of rungs, the horizontal distance to the first handhold shall be at least 8 inches but no greater than 10 inches.	The Handbook be clear about the requirements for horizontal ladders. The 8-10 inch requirement (ASTM 8.3.2) is only when access to upper body equipment is with the use of rungs (as in vertical type rung ladder). This requirement has been in ASTM F1487 since first published in 1993. The 08 CPSC 5.3.2.4 first time requirement makes all existing equipment installed to ASTM F1487 non-compliant to CPSC 08 when using the less than 10 inch rule off a platform. (This was not in the 07 CPSC draft.)	Section 5.3.2.4 will be modified as follows: Modify the second bullet as follows: For horizontal ladders accessed from a platform, the horizontal distance from the platform out to the first handhold should be no greater than 10 inches. Add the following bullet: For horizontal ladders accessed by rungs (e.g., ladders), the horizontal distance from the access rung to the first handhold should be at least 8 inches but no greater than 10 inches.
5.3.2.5, Page 28, Overhead rings -The horizontal distance to the first handhold should be at least 8 inches but no greater 10 inches.		The Handbook be clear about the requirements for overhead rings. This is the same issue as 5.3.2.4, previous points. (This was not in the draft 07)	Modify the second bullet as follows: For overhead rings accessed from a platform, the horizontal distance from the platform out to the first handhold should be no greater than 10 inches. Add the following bullet: For overhead rings accessed by rungs (e.g., ladders), the horizontal distance from the access rung to the first handhold should be at least 8 inches but no greater than 10 inches.
Section 5.3.2.7 -Fifth bullet point states, "Nothing should ever be tied or attached to any part of a track ride".		Changing verbiage to, "Nothing should ever be tied or attached to any part of a track ride trolley or handle". We do not want to allow the possible interpretation that track rides can not be attached	Sentence reworded to "Nothing should ever be tied or attached to any moving part of a track ride."

	or "tied to" a composite structure.	
5.3.3, page 29, Log Rolls -Use Zones the use zone may overlap with neighboring equipment if the other piece of equipment allows overlapping use zones and There is at least 6 feet between equipment when adjacent designated play surfaces are no more than 30 inches high; or There is at least 9 feet between equipment when adjacent designated play surfaces are more than 30 inches high.	Log Roll use zones per clause 5.3.3 are for free standing log rolls and therefore should be stated as such. Fig. 14 illustrates a log roll can be a component attached to a composite structure but the text of 5.3.3 would restrict it. Please note: Log Rolls are permitted to be both free standing and part of a composite structure.	"<u>When not part of a composite structure</u>," will be added to the beginning of the use zone bullet.

5.3.6.3.5, page 34, Tube Slides Recommendations for barriers or textured surfaces to prevent climbing and sliding on top of the tube is not well thought out. It is well documented that children can access equipment despite barriers being placed around and climb 7 foot barrier walls, e.g. soft contained play equipment. Also, textured surfaces on	The last point in this section recommends transparent tube sections for observation/supervision. Transparent plastic sections have a shorter life cycle than solid colored plastic sections. Transparent plastic has a much higher maintenance requirement and when these sections fail, they can be very dangerous with sharp splinters.	Removing second and fourth bullet points in 5.3.6.3.5.	Second bullet is consistent with 1997 playground handbook and will not be changed. Fourth bullet will be reworded as follows "Supervisors should be aware of children using tube slides since the children are not always visible."

5.3.6.5, Page 35, Slide use zone - Slide exit use zone is not consistent with ASTM. CPSC slide use zones are based on free standing slides and have not change or updated with ASTM and composite structure use zones. CPSC Injury Study states the current use zones (updated use zone for composite structures and independent use zone) are not a factor for injuries in their findings. With that there should be no conflict between CPSC and ASTM.	There is a clear difference between independent equipment and composite play structures and the different use zones for each.	Add to the 2nd paragraph the word "independent" so the Sentence would read "Different types of independent equipment have different use zones....." This would assist in clarifying the difference between independent equipment and composite play structures.	Caption for figure 21 will clarify "stand-alone slides." Under preschool/school age: first bullet modified to read: "This recommendation does not apply to embankment slides or slides that are part of a composite structure." Second bullet modified to read "…two or more slide use zones may overlap…" Add bullet for composite structures similar to toddler bullet. New section added before 5.3.9 "5.3.9 Fall height and use zones for composite structure. When two or more complementary play components are linked together in a composite structure (e.g., combination climber, slide, and horizontal ladder), the use zone should extend a minimum of 6 feet from the external perimeter of the structure. In certain areas, this use zone may need to extend further due to the nature of the closest activity (e.g., slide exit zones). [Figure will be provided]"
5.3.8.1 Swings-Hardware requirements are only mentioned in this section of the Handbook.		It would be more consistent with ASTM to have a section on hardware, requiring all hardware to meet these conditions, not just swing hardware.	Please see section 2.5.2 Hardware, page 11, which contains seven bullets related to hardware. This is under section 2.5, Materials. CPSC staff feels this is the appropriate location for the section on Hardware. Some information is repeated in swings, s-hooks in particular, to be absolutely sure it is not missed.

5.3.8.3.2 -The recommendation that only the same style of seat such as "fully enclosed" be suspended from the same bay is fine when there is more than one bay, but a problem when there is only one bay.	Consider allowing the use of an open seat with a bucket seat when a swing set has only one bay. This requirement, as currently written, places an undue burden on small child care centers that have limited space.	This recommendation is consistent with previous versions of the handbook and appeared verbatim in the 1997 handbook. The rationale then, as now, is to separate swings for younger children from those for older children since younger children are more likely to be struck by swings. This recommendation does not require a child-care center to have multiple bays for swings; therefore, CPSC staff feels the primary burden is a disutility for the children who are developmentally appropriate for the type of swing not in the bay. Staff does, however, recognize that there are certain situations (private child care centers with tall fences that keep the general public out and that maintain a very low adult:child ratio) where it could be acceptable to mix swing types, but any exception may lead to misinterpretations and mixed swings appearing elsewhere where it is never appropriate. CPSC staff encourages manufacturers to explore methods so that child care staff could easily change swing types for different ages and abilities. CPSC staff would also like to respond to verbal requests to “allow ADA accessible swings with bucket swings,” with the rationale that both require adult assistance. Staff does not feel this is appropriate as these swings are larger and heavier, increasing the likelihood that a small child will not be seen by the adult and possibly increasing the severity of an injury should a small child be struck by a moving swing.
Section 5.3.8.3.2	Remove the minimum and maximum pivot point heights for full bucket swing seats. Or at least change the maximum to 96". The current verbiage makes any 8' swing with full bucket seats existing in the field non-compliant.	CPSC staff agrees that it should read 96".

5.3.8.3.3 Swing use zones - CPSC recommendation is not fully consistent with ASTM as ASTM allows the use zone of the stationary supports to overlap other use zones with a min. overlap of 108". This overlap is included for other stationary components but has been omitted for swings. In addition, the requirements for multi-axis versus single-axis are different, as multi-axis allows for the overlap to be with "other playground equipment structures" where the single-axis requirement only allows overlap with "an adjacent swing structure".	9.4.1.5 Swing use zones -The use zone surrounding the support structure of a to-fro swing shall extend no less than 72" in all directions from the structure. (1) the support structure use zones for adjacent to-fro swings may overlap; (2) the use zone for a support structure of a to-fro swing in the use zone of other play equipment may overlap. The minimum overlap shall be 108".	Single axis definition of use zone be consistent with multi-axis definition of use zone and add to the last sentence "or other playground equipment structure". CPSC does allow the stationary supports of tire swings to overlap other play events with a minimum of 108 inches which leads us to believe that the omission for to-fro swings was an error.	"… *or other playground equipment structure*," will be added to the end as requested.
5.3.8.4 Tire Swings -CPSC has removed the 35 pound weight limit for tire swings.		Put the 35 pound weight limit back into the handbook.	Historical documents, including the 1994 and 1997 version of the Handbook, do not contain this limit. The wording in 2008, 1997, and 1994 is the same: “To minimize the hazard of impact, heavy truck tires should be avoided.”

5.3.9. Use Zones -There is no mention in the document of how to treat the use zone of a composite structure or of play functionally linked pieces. Without clarification play functionally linked components which were part of a composite structure linking one platform to another requires a nine foot minimum separation in between each component.	Functionally linked play structure is defined as: Play structure that acts as a single unit in its physical form or sense of function as continuous play, even if the components are not physically attached.	Allowing for functionally linked play structures. The nine-foot separation disallows play functionally linked pieces in a layout/design.	Composite structures added (see comment on 5.3.6.5). Additionally, CPSC staff will modify "Composite Structure" in the list of definitions, to use the same definition as the Access Board and ASTM "Two or more play structures attached *or <u>functionally linked</u>*, to create one integral unit that provides more than one play activity." Play functionally linked structures will then be covered by the composite structure section.
B.2.5 Head entrapment -The recommendation that the torso probe has to be able to penetrate an opening to a depth of 4 inches has been eliminated. The 4" depth is illustrated in Figure B8, but not mentioned in any of the copy.		It is recommended that CPSC add this back into the handbook to be consistent with ASTM and the prior CPSC documents. It is our understanding the reason for having the four inch depth of penetration was relating to a head first entry into an opening. 4 inches is the point at which the ear flaps could become caught, it had nothing to do with a feet first entry. The 4 inch depth penetration has been in the CPSC Handbook since the 91 Revision. Adding this back would	It is unclear exactly which test procedure is of concern. CPSC staff checked copy in the 1997 version of publication #325 and did not see a specific requirement for "4 inches." The only test procedure in 1997 or 2008 that uses the probes (figure B8) is that for flexible openings. Therefore, CPSC staff assumes this is the test procedure of concern. Step 5 in B.2.6.5 will be modified to add "completely" for clarity. "Determine whether the probe can be pushed or pulled *<u>completely</u>* through the opening by a force no greater than 30 pounds on toddler playgrounds or 50 pounds on preschool-age and school-age playgrounds."

	maintain the consistency of CPSC rationale and Handbooks and would be consistent with ASTM.	
Fig. 11/13, page 26/27 does not illustrate the 15 inch max. opening requirements.	We suggest adding an indicator showing the 15" opening and then adding the overhead rail to the illustration, or referencing readers back to the section that states "if greater than 15", one horizontal rail must be added."	Handholds will be modified and overhead rail added to the figure.
Fig. 11/13, page 26/27 does not illustrate the 15 inch max. opening requirements.	We suggest adding an indicator showing the 15" opening and then adding the overhead rail to the illustration, or referencing readers back to the section that states "if greater than 15", one horizontal rail must be added."	Overhead rail will be added above flexible net in the figure.

Table 6, Page 22 Stairways, Vertical rise -Pre-School-less than or equal to.	Changing the sign. The table indicates "greater than or equal to" instead of "less than or equal to". All the signs in this table should be checked for accuracy.	CPSC staff will make this and other necessary modifications in this table that occurred during final print layout processing.

List of all planned modifications

List of all planned modifications to Public Playground Safety Handbook

1. Final PDF deliverable to have hyperlinked table of contents and all cross-references (e.g. "See §5.3.2" or "See Table 3") to be hyperlinked to the reference.

2. Final deliverable to be delivered in print-ready PDF, download ready PDF, and in a format readable by MS Word 2007 (to facilitate maintenance of the document).

3. Cover: Change layout to indicate new version.

4. Page header (throughout): Add "Public" to page header

5. Scope: Last sentence modified as in *italics:* "However, *the Commission* believes that the recommendations in this handbook *along with the technical information in the ASTM standards for public playgrounds* will contribute to greater playground safety."

6. 1.2 Intended Audience: Add "The voluntary standards listed in 1.4.1 contain more technical requirements than this handbook and are primarily intended for use by equipment manufacturers, architects, designers, and any others requiring more technical information.

7. 1.3 What is a Public Playground: Last sentence modified to read "*Child care facilities, especially indoor*, should refer to ASTM F2373…"

8. 1.4.1 ASTM playground standards: First sentence modified as in *italics*: "Below is a list of ASTM t*echnical performance* standards that relate to playgrounds."

9. 1.7 Playground injuries: Modified to reflect 2009 playground injury study:

   The U. S. Consumer Product Safety Commission 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%).[1] *Other hazard patterns involved colliding with other children or stationary equipment and entrapment. Playground-related deaths reported to the Commission involved entanglement of ropes, leashes, or clothing; falls; and impact from equipment tip over or structural failure.*

   [1] *O'Brien, Craig W..; Injuries and Investigated Deaths Associated with Playground Equipment, 2001-2008. U.S. Consumer Product Safety Commission: Washington DC, October, 2009.*

10. 1.8 Definitions: Composite structure modified to read: "Composite Structure – Two or more play structures attached or *functionally linked, to create* one integral unit that provides more than one play activity."

11. 1.8 Definitions: Projection modified to read: “Projection – *Anything* that extends…”

12. 1.8 Definitions: Protrusion modified to remove “or whose clothing becomes entangled on it.”

13. 1.8 Definitions: Toddler modified to read “Children 6 months through *23 months* of age.”

14. 2.2 Selecting a site: Change last heading in table to “If yes, then… *Mitigation*.”

15. 2.2.2 Age Separation: After this section, a new 2.2.3 Age Group section to be added with text as follows:

    In areas where access to the playground is unlimited or enforced only by signage, the playground designer should recognize that since child development is fluid, parents and caregivers may select a playground slightly above or slightly below their child's abilities, especially for children at or near the cut-off age (e.g., 2-years old and 5-years old). This could be for ease of supervising multiple children, misperceptions about the hazards a playground may pose to children of a different age, advanced development of a child, or other reasons. For this reason, there is an overlap at age 5. Developmentally a similar overlap also exists around age 2; however, due to the differences in ASTM standards and entrapment testing tools, this overlap is not reflected in the handbook. Playgrounds used primarily by children under the supervision of paid, trained professionals (e.g., child-care centers and schools) may wish to consider separating playgrounds by the facility's age groupings. For example, a child-care facility may wish to limit a playground to toddlers under 2 exclusively and can draw information from this guide and ASTM F2373. A school, on the other hand, may have no children under 4 attending, and can likewise plan appropriately. Those who inspect playgrounds should use the intended age group of the playground.

16. 2.2.3 Conflicting activities: Remove bullet and sub bullet that begins “Use zones for moving equipment…” The information is provided more clearly elsewhere.

17. 2.2.3 Conflicting activities: Final paragraph, which begins “Composite play structures…” to be turned into a bullet and the following sentence added to the end of the paragraph. *“For example, an access component should not be located in a slide exit zone.”*

18. Table 1: Titled changed to “*Examples of* Age Appropriate Equipment”

19. Table 1: Photo for grade school modified to provided photo.

20. Table 1: “Toddler – *Ages 6-23 months”*

21. Table 1: “Preschool – Ages 2-5 *years”*

22. Table 1: “Grade school – Ages 5 – 12 *years”*

23. 2.4.2.2 Third paragraph: “tips 1-7” changed to “tips 1-9”

24. 2.5.5 Wood: Second bullet to read:
    - Creosote-treated wood *(e.g., railroad ties, telephone poles, etc)* and coatings that contain pesticides should not be used.

25. Table 2: Shredded/recycled rubber changed to *6* inches recommended, with the following footnote:
    Shredded/recycled rubber loose-fill surfacing does not compress in the same manner as other loose-fill materials. However, care should be taken to maintain a constant depth as displacement may still occur.

26. 2.4.2.2. Modify item 7 to read: “Never use less than 9 inches of loose-fill material *except for shredded/recycled rubber (6 inches recommended)*. Shallower depths are too easily displaced and compacted.”

27. 3.2.1 Strings and Ropes: Modify last bullet to read “The following label, *or a similar sign or label*, can be places on *or* near slides or other equipment where potential entanglements may occur.

28. 3.3.2 Angles – replace this entire section with:
    3.3.2 Partially bound openings and angles
    Children can become entrapped by partially bound openings, such as those formed by two or more playground parts.
    - *Two accessible adjacent parts should not form angles less than 55 degrees, unless one side is horizontal or below horizontal.*
    - *Use the partially-bound opening test in Appendix B to identify hazardous angles and other partially-bound openings.*

29. 3.5 Suspended Hazards. Text to by modified to read:
    Children using a playground may be injured if they run into or trip over suspended components (such as cables, wires, ropes, or other flexible parts) hanging from one piece of the playground equipment to another or to the ground. *These suspended components can become hazards when they are within 45 degrees of horizontal and are less than 7 feet above the protective surfacing. To avoid a suspended hazard, suspended components:*
    - *Should be located away from high traffic areas.*
    - *Should either be brightly colored or contrast with the surrounding equipment and surfacing.*
    - *Should not be able to be looped back on themselves or other ropes, cables, or chains to create a circle with a 5 inch or grater perimeter.*

- *Should be fastened at both ends unless they are 7 inches or less long or attached to a swing seat.*

These recommendations do not apply *to swings, climbing nets*, or if the suspended component is more than 7 feet above the protective surfacing and is a minimum of one inch at its widest cross-section dimension.

30. Figures 2 and 3: Modify caption to read: "Example of a hazardous *projection…*"

31. 3.6 Tripping hazards: Second sentence modified to read "*Two common causes of tripping are…*"

32. 5.1.3 Guardrails and protective barriers: First bullet rephrased into two bullets as follows:
    - *Completely surround any elevated platform.*
    - *Except for entrance and exit openings, the maximum clearance opening without a top horizontal guardrail should be 15 inches.*

33. 5.1.3 Guardrails and protective barriers: First sentence in second non-bulleted paragraph modified as follows: "Guardrails or protective barriers should be provided on elevated platforms, walkways, landings, *stairways,* and transitional surfaces."

34. Figure 6: Modify drawings as follows: Arch climber to have handles facing each others.

35. Figure 6: Modify drawings as follows: Add horizontal top rail to one figure.

36. Table 6 Stairways: "Tread depth (open riser)" (add closing parenthesis)

37. Table 6 Stairways: Vertical rise: " $\leq 7''$ $\leq 9''$ $\leq 12''$" (all symbols are less than or equal)

38. Table 6 Step ladders: Vertical rise: " $> 5''$ and $\leq 7''$ $\leq 9''$ $\leq 12''$" (all symbols are less than or equal)

39. 5.2.2: Add "or maximum cross-section" after each instance of diameter.

40. Figure 7: Caption under bottom photo changed to "Overhead loop ladder."

41. 5.3.2 Climber and upper body equipment. Final sentence to be deleted (sentence begins "However, playground designed for children under 4 years of age…"). This information appears elsewhere more clearly.

42. Figure 8: Caption to be modified to read "Use zone surrounding a *freestanding* arch climber."

43. 5.3.2.1 Fall Height: First bullet to be modified to read "*Unless otherwise specified in this section,* the fall height for climbers…"

44. 5.3.2.1.5 Other consideration: modify font and color to be consistent with other 5th level headings.

45. 5.3.2.1.5 Other considerations: Last sentence to be modified to read "See Figure 9 *for an example of a climber that does not follow this consideration."*

46. Figure 9: Caption to be modified to read "Climber with rigid structural components that *does not meet 5.3.2.1.5*"

47. Figure 11: Modify drawing as follows: Arch climber to have handles facing each other.

48. Figure 12: Photo of three-dimensional structure cropped to remove fence posts.

49. Figure 13: Horizontal top rail added above net access.

50. 5.3.2.7 Track rides: Second to last bullet modified as follows "Nothing should ever be tied or attached to any *moving* part of a track ride."

51. 5.3.3 Log Rolls: Fifth bullet modified to read "*When not part of a composite structure*, the use zone may overlap…" Add reference to new section, tentatively 5.3.9, "Fall heights and use zones for composite structures."

52. 5.3.4.1 Use zone: Reword final bullet as follows: "*The use zone may not overlap other use zones, unless the rotating equipment is less than 20 inches in diameter and the adjacent equipment allows overlap.*" This replaces the text removed from 2.2.3 ("Use zones for moving equipment, such as swings and merry-go-rounds, and slide exits should not overlap the use zone of other equipment, regardless of height. – One exemption is for moving equipment where the diameter of the platform is less than 20 inches and the designated play surface of the adjacent equipment is less than 30 inches.")

53. 5.3.6 Slides: Add new photo provided somewhere within section (illustrating two children sliding down a dual slide attached to a composite structure). If possible, remove person standing behind children and the designs on the children's shirts.

54. 5.3.6.3.5 Tube slides: Reword final bullet as follows: "*Supervisors should be aware of children using tube slides since the children are not always visible.*"

55. 5.3.6.5 Side use zone, Preschool- and school-age: Add to end of first bullets "… embankment slides *or slides that are part of a composite structure.*" Add reference to new section, tentatively 5.3.9, "Fall heights and use zones for composite structures."

56. 5.3.6.5 Side use zone, Preschool- and school-age: second bullet modified to read "… two or more *slide use zones* may overlap…"

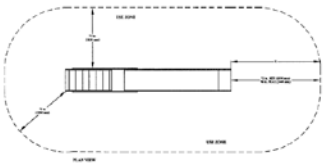
57. 5.3.6 Slides: Add new section:
    5.3.6.8 Other sliding equipment.

    Equipment where it is foreseeable that a primary use of the component is sliding should follow the same guidelines for entanglement that are in 5.3.6.7.

58. 5.3.6.7 Entanglement hazard: Remove final "NOTE".

59. Figure 21: Caption to read "Use zone for *stand-alone* slides"

60. Figure 21: Modify to show zone at end of slide, similar to the following:



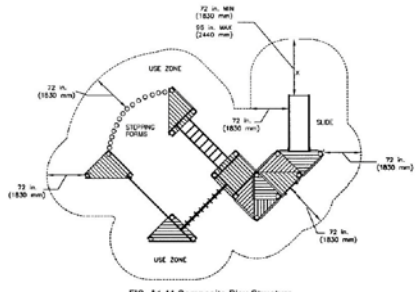
61. Table 7: Table title to read "*Minimum* clearance dimensions for swings."

62. 5.3.8.3.2 Full bucket seat swings: Numbers in final bullet to be 47 and *96*.

63. 5.3.8.3.3 Use zone for single-axis swings – belt and full bucket: Add to last sentence of final bullet "… an adjacent swing structure *or other playground equipment structure*."

64. 5.3.9 Fall height and use zones not specified elsewhere: Before this section, add new section:
    5.3.9 Fall height and use zones for composite structure.

    When two or more complementary play components are linked together in a composite structure (e.g., combination climber, slide, and horizontal ladder), the use zone should extend a minimum of 6 feet from the external perimeter of the structure. Where slides are attached to a platform higher than 6 feet from the protective surfacing, the use zone may need to extend further in front of the slide(see section 5.3.6.5)). [Example figure below, graphic artist to create something similar]



65. B.2.4 Angles: Delete section in its entirety, as it has been replaced by new section on Partially Bound Openings.

66. B.2.6.5 Flexible openings, Step 5: Modified to read “Determine *if* the probe can be pushed or pulled *completely* through the opening by a force no greater than 30 pounds on toddler playgrounds or 50 pounds on preschool-age and school-age playgrounds.”

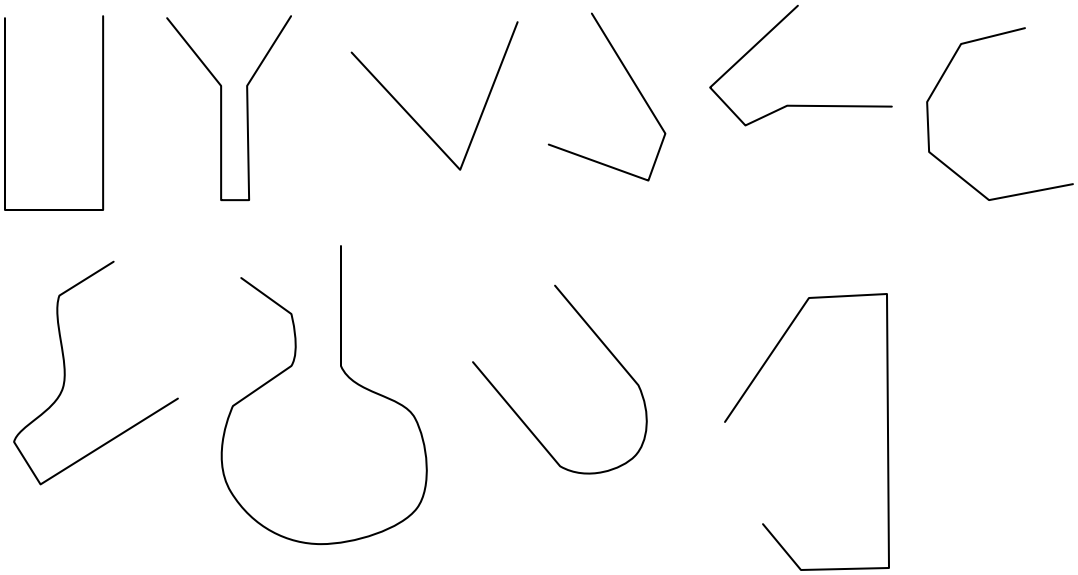
67. B.2.6.5 Flexible openings, Step 5: Add representative Pass and Continue pictures provided.

68. B.2.6.5 Flexible openings, Step 7: Modified to read “Determine if the large head probe can be pushed or pulled *completely* through the opening by a force no greater than 30 pounds on toddler playgrounds or 50 pounds on preschool-age and school-age playgrounds.”

69. B.2.6.5 Flexible openings, Step 7: Add representative Pass and Fail pictures provided.

70. Appendix B: Add new section B.2.6.6 Partially Bound Openings.

    A partially bound opening is any opening which has at least one side or portion open, such as a U- or V-shaped opening. These openings can still pose an entrapment hazard by allowing the neck to enter but not allowing the head to slip out. Several examples of this situation are shown in the figure below.



Note: Test procedure write-up is still in development and usability testing. Above graphics to be improved by graphic artist.

71. Table 3: Repeated as full size page at end of handbook to facilitate duplication and use as a routine checklist.