#69

IPEMA
INTERNATIONAL PLAY EQUIPMENT MANUFACTURERS ASSOCIATION

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July 10, 1997

Mr. John Preston
UNITED STATES CONSUMER PRODUCT
SAFETY COMMISSION
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VIA: Hand Delivered

Dear John,

The International Play Equipment Manufacturers Association (IPEMA) would like to thank you and the CPSC for affording us with the opportunity to comment on the draft of a revised CPSC Handbook for Public Playground Safety. In addition, we appreciate your extending the deadline to July 10 to assemble, as a group, IPEMA's comments.

At IPEMA's last meeting on June 18, we, as a group, isolated our common concerns regarding the draft CPSC Handbook update. We divided the workload of developing "observation, rationale, and recommendation" for each item by small committees. The effort of these committees was to send to our Administrator, Bill Duffy, the draft documents to compile and then distribute them to our entire organization for review and comment. After receiving the final comments of the membership we arrived at an organizational consensus of the enclosed document.

With IPEMA membership approaching 40 member companies we estimate that we currently represent in excess of 90% of all public playground equipment manufactured in North America. Our combined experience in the cause and effect of equipment design and layout, and how they affect the incidence of accidents and particular injury types, is greater than any other single source available. Admittedly, the prevailing atmosphere of litigation threat over the past 15 years and the increased pressure from the media and independent organizations, such as the CPSC and NRPA, has weeded out or influenced the change in manufacturers necessary to raise our industry standards to unprecedented heights of effective safety consciousness. This new attitude has resulted in the development of the ASTM F1487 Standard, the formation of NPSI educational certification courses, the IPEMA organization, and the IPEMA third-party certification program, all of which have existed for a relatively short time. However, they have all had a huge impact on how the administrators of public play environments handle their responsibilities.

As you are probably aware, several states are in the process of mandating compliance with CPSC and/or IPEMA certification which effectively mandates compliance with the most current ASTM F1487 Standard. NPSI is approaching the certification of 2,000 Play Safety Inspectors nationwide. The majority of these inspectors are staff members of agencies that are responsible for the ongoing safe and compliant condition of their public playgrounds. The course reviews and tests for the awareness of both

CPSC and ASTM F1487 when doing inspections, but draws more heavily from the latter since it has the more "measurable" criteria. In the second paragraph of the CPSC draft there is a statement, ". . . [ASTM F1487] is primarily intended for use by equipment manufacturers." that demonstrates an outdated attitude by the CPSC regarding all the other efforts toward increased public playground safety that are ongoing. In all fairness, we recognize that many of the changes referenced here are so new that the CPSC has had no real opportunity to measure their effectiveness, but the public has shown that they have more faith in the new measurements of accountability, education, and exact criteria available than does the CPSC.

You came before the ASTM F15.29 Subcommittee some months back and stated a mission, to be accomplished before your personal retirement, of the elimination of the remaining conflicts between the two major documents on public playground safety in our society. Instead, we feel that the CPSC has drafted a document that will present to the American public even more conflict than before - conflict that can only result in increased confusion and dissention on the subject of playground safety. We also feel that many of the changes in the draft document are based on speculation rather than experience, significant cited case studies, and/or available injury data. As you know from participating in the ASTM process, these are requirements for even the most minute addition or change in the ASTM F1487 Standard.

We recognize that you and the CPSC are receiving political pressure and opinion from many directions right now as you move through the process of updating your worthy document. Therefore, we appeal to you to consider the process and resources behind the varying viewpoints when making your decisions. We trust that in the end, what serves the public best has been, and always will be, your highest priority. The resulting confusion of two conflicting references will not accomplish this. We are ready to support your efforts if you are committed to a reasonable process that will result in documents with a minimum of conflict.

Again, IPEMA thanks you for the opportunity to provide input on your revised CPSC Handbook for Public Playground Safety and we wish you success on this project.

Respectfully yours,

Jeffrey L. Olson
IPEMA President

cc: IPEMA membership

7/10/97

IPEMA COMMENTS ON THE DRAFT OF THE REVISED CPSC HANDBOOK FOR PUBLIC PLAYGROUND SAFETY

Section 4.3 Surfacing

This section widely uses the term accessible and may cause confusion when used in conjunction with the proposed ADA accessible requirements for playground equipment.

Recommendation: Use different words to give the same meaning such as: attainable, obtainable, reachable, or climbable.

Section 4.3.1 Recommended Maximum Accessible Heights

The 4' height restriction for preschool-age children basically eliminates the use of guardrails on all play platforms over 18" above the protective surfacing (4.3 Elevated Platforms Including Slide Platforms).

The 5' height restriction for horizontal ladders is not consistent with the 4' foot rationale.

Draft Page 6 - 1st paragraph NOTE: The statement is too restrictive and generalizes the requirement. Does this mean access and egress is only by a fully enclosed compound?

Fully enclosed structures restrict visual site lines important for good supervision while encouraging children to climb on exterior portions of the enclosed barriers and components. Refer to draft section 6.2, 2nd paragraph.

Recommendation: The maximum height restrictions should be removed from the handbook.

Additional Comments: We disagree with the maximum limitation of 8' for swings because they have been produced at 10' and 8' for many years with no significant difference in numbers or severity experienced on either of them. We would like to see statistical data that validates the increase in injuries on 10' high units. In addition, it seems somewhat reasonable to expect totally enclosed composite play structures to have similar height restrictions. As you know, "Kids will be Kids", and climb up the outside of play equipment to the top of barrier walls. In fact, this is far more likely than having children climb to the top of a 10' high swing beam. If you use the recommendations from the CPSC concerning a composite structure, the deck could be at 8' and the barrier could be 38". The fall height then would be 11'2", which is much greater than the 10' swing set height. Therefore, it seems logical to leave the 10' seing set height as a requirement for school age children.

More Comments: The Draft states that the highest accessible part of the equipment is to be eight (8) feet. The issue is not how high the equipment is, but rather making sure that there is impact absorbing surfacing under and around the equipment of a type and depth appropriate for the equipment. A five (5) foot high deck without proper depth and type of safety surfacing would be

much more hazardous than a ten (10) foot high deck with the proper depth and type of safety surfacing.

Both the draft and the current edition (1994) of the Handbook show in the table of Critical Height of Tested Materials that there are many surfacing materials of various types and depths that provide the necessary fall protection for equipment higher than eight (8) feet, **using the criteria for critical height that is listed in the handbook**, and in the ASTM F1292 Standard for playground surfacing. We feel very strongly that it is inappropriate to arbitrarily limit the height of equipment when the CPSC's own tests have shown that proper protective surfacing can be provided and maintained under and around tall play structures.

Based upon the CPSC Handbook recommendation that protective surfacing should meet ASTM F1292 for the maximum G force of 200 and HIC criteria of 1,000, the **height of the fall becomes immaterial**. A fall from a short height and a fall from a very tall height would have the same results if the proper protective surfacing is provided under and around both pieces of equipment.

The ASTM F1487 Standard contains no maximum height limitations for slides or platforms. It was logically and correctly concluded that as long as there is the proper type and depth of safety surfacing under and around the equipment, no maximum height would be necessary to prevent serious injury. It is important to realize that **this standard was developed not by an isolated individual or individuals with a particular agenda, but by a large and diverse group of individuals representing all perspectives on the issue**. These included consumer advocates, experts in child development, experts in playground safety and design, representatives from the CPSC and play equipment manufacturers with hundreds of years of experience between them. **The fact that this distinguished group carefully and objectively looked at the evidence and determined that height limitations were not necessary should not be ignored**.

For many years, IPEMA members have manufactured tall equipment such as slides that have the highest accessible parts ten (10) to twelve (12) feet above grade without receiving reports of significant injuries due to falls from these slides onto safety surfacing of the proper type and depth.

Part of the rationale used by the CPSC in setting this arbitrary eight (8) foot maximum height is a study from New Zealand that purports to show that injuries increased as equipment height increased. Unfortunately, this study is not valid. Upon close examination, it was found that other critical factors were ignored, **such as the presence and adequacy of safety surfacing**, when making the link between the number and severity of injuries and the equipment height.

Another part of the rationale stated that the recommendations were based on "inputs from interested parties received during and after a playground safety roundtable meeting held in October 1996 ...". At this meeting several opinions were incorrectly stated as fact. Among these were that there was **no play value to be gained from equipment height. This is absolutely incorrect**. You don't have to have a Ph.D. in child development to see that the first place the children go to on a play structure is the tall slide or tall deck. Children have been fascinated and excited by height as evidenced by the first child to climb a tree. Many experts contend that exposure to the height sensation is critical to a child's development.

The draft states that equipment that is totally enclosed may be higher than eight (8) feet tall. We feel that totally enclosing a structure will actually encourage children to climb on the outside, or top, of a structure.

In the *Recommended Maximum Accessible Height for Pre-School Age Children*, a combination of requirements in the draft has caused the following apparent error. On a pre-school play unit, guardrails cannot be used on a platform if the platform is greater than 19 inches in height. This is due to the following draft requirements:

1. Section 4.3.1 states that for pre-school age children, the maximum accessible part of the equipment should be no more than four (4) feet above the protective surface.

2. Section 4.3 states that if guardrails are used around a platform, then the top of the guardrail becomes the highest accessible part of the equipment.

3. Section 11.3 states that for pre-school age children, a guardrail is acceptable for decks greater than 20 inches but not over 30 inches in height.

4. Section 11.4 states that a guardrail for pre-school age children must be at least 20 inches high.

The result is that a 20 inch high platform for pre-school age children that uses the recommended 29 inch high guardrail has a maximum accessible height of 49 inches. This 49 inch height is not allowed per section 4.3.1 which requires a maximum height of 48 inches for pre-school age equipment. In fact, no platform between 20 and 30 inches high surrounded by guardrails can comply with the maximum accessible height requirement.

Recommendation: It is a violation of draft section 4.3.1 (maximum accessible height) if a platform for pre-school age children has guardrails that comply with section 11.3 (guardrails). Section 4.3.1 must be modified to allow guardrails on pre-school age platforms up to 30 inches in height.

Section 5 Fall Zones For Equipment

The CPSC uses the term Fall Zone which is in conflict with ASTM Standards and the proposed ADA Rule and the harmonization effort with Canadian Standards.

Recommendation: Change Fall to Use to be consistent with ASTM Standards and Federal Regulations (ADA).

The last paragraph for Section 5 is too broad in it's interpretation and could mean any part of the structure or free standing equipment.

Recommendation: Reword this paragraph to better explain the hazard.

Rationale: This paragraph could mean a balance beam or spring rider might be interpreted as something a child may run into or fall onto.

The last sentence of Section 5 contains a statement that is to general and needs to be clarified by illustration or improved wording.

Section 5.1.6 Spring Rockers

It appears that an editorial correction needs to be made. It seems that when the sentence was taken from the 1994 Handbook, the word "seat" was inadvertently left out from between the words "maximum" and "height". The sentence should read: "... spring rockers with a maximum seat height of 30 inches may share the same fall zone."

Section 6.1 Choosing a Site

There is a conflict in that CPSC publication No. 362, Safety Barrier Guidelines for Home Pools allows for 4" openings, while the CPSC Handbook and ASTM Standards restrict openings to a minimum of 3.5" to guard against feet first entry. CPSC Handbook Section 9.6, Entrapment, first sentence, 2nd paragraph.

Recommendation: Add a statement requiring 3.5" maximum openings for fence barriers around playground equipment which is designed for 2 to 5 years of age to prevent feet first entry and potential head entrapment.

Section 7 Installation and Maintenance of Equipment

This section is in conflict with the draft Section 1 Introduction regarding the intended audience.

Section 7 states that the installers and inspectors should not deviate from the manufacturer's assembly and maintenance product specifications which are based on ASTM F1487, the standard manufacturers, installers and inspectors use.

The use of the draft handbook would produce a conflict in specification requirements and the intended audience of the ASTM and CPSC.

Recommendation: A review of the intended audience should be undertaken to avoid any confusion between technical requirements for manufacturers, as well as any person or group responsible for the installation, inspection, maintenance for playground equipment and general lay person information the CPSC handbook was going to address.

Rationale: It is important to provide a consistent and uniform set of rules for the industry to use, even if the information is technical or in a general format.

Section 9.2 Warning

Add fencing to the warning (drawstrings) as children have been entangled by drawstrings on fencing surrounding playground equipment.

Rationale: Handbook draft includes Fencing Section 6.1.

Section 10.2 Stairways Table

The CPSC maximum slope is 35° and the ASTM maximum slope is 50°.

Recommendation: Change the CPSC Handbook to allow for a greater slope.

Rationale: Children become familiar with step heights in the home and at schools from a very early age. A traditional pitch for dwelling stairs is around 41° as stated by Jake Puals article - Building Standards/Jan.-Feb., 1991. Playground equipment is provided for many reasons, one of which is to provide challenges, at a measurable risk by the intended user.

Manufacturers have provided stairways of varying degrees for a maximum of 50° slope on their equipment for a good many years without the reports indicating this is a problem on the play equipment. Thus, unless CPSC can provide injury data on play equipment to support the lower slope of 35° for stairways, consideration should be given to ASTM F1487.

Additional Rationale: The CPSC 35° slope for stairways seems inconsistent with the rest of the current "world" standards and/or recommendations. The current ASTM F1487 Standard recommends a stairway to be 50° or less. The current Canadian Standard CSA-Z614-M90 recommends a stairway to be 30°-50°. The British Standard BS-5696: Part 2: 1986 recommends that stairways have a slope between 15°-45° and 45°-55°. The current CFA Model Law recommends that a stairway have no slope greater than 50°. The current Malaysian Standard MS 966: Part 2 recommends stairways to be between 15° and 45°. The current draft of the European Committee for Standardization, CEN draft prEN 1176-1 recommends that stairways have a slope between 15° and 60°. We have copies of all these documents available for your review.

More Rationale: A stairway provides a very low degree of challenge when accessing public play equipment. Typical construction of public playground stairways in recent years have had slopes ranging from 40° to 50°. We are not aware of these products being involved in any injuries to equipment users. Further, a typical building code recommends an 8¼" rise and a 9" run for residential construction which equates to a 42° slope. Building code recommendations for stairways typically provide for access between floors having 9 to 15 foot height differentials and must provide a means of transporting large heavy furniture and other household objects between floors. In contrast, the playground stairway is generally limited to a 4 foot height differential and does not have the intended requirement of transporting heavy, large, or bulky items.

To summarize, existing playground stairways with slopes between 40°-50° have not been identified as being hazardous to users. The existing ASTM recommendation of 50° is reasonable

given the current parameters of function in the residential and public playground environments to which each is subjected. Harmonization of all standards and guidelines is very important given the fact that we are in such a global market and community.

If 35° stairways become the CPSC recommendation, the US consumer would be faced with the decision of having an expensive 35° stairway or a steep (50°-75° slope) stepladder. Please note that the term expensive represents not only the cost of the physical stairway component, but also relates to the amount of real-estate occupied by this stairway as well as the additional amount of surfacing material required under and around it.

Section 11.2 Guardrails and Protective Barriers

The change from horizontal to vertical is somewhat confusing since Guardrails are by nature horizontal. Therefore, it might be more logical to change to horizontal rails with vertical fillers.

Section 11.3 Minimum Elevation Requiring Guardrails and Protective Barriers

The second paragraph (Preschool-age Children) is in conflict with Section 4.3.1 maximum height of 4'. Since the fall height is measured from the top of the guardrail, the platform height becomes restricted to the point that guardrails will no longer be used.

Recommendation: Refer to comments on Section 4.3.1

Section 11.4 Minimum Height of Guardrails

School-Age Children: "... the lower edge should be no more than 26 inches above the platform." [Section 7.4.3.4 of ASTM 1487-95 and the North America Harmonized Standard say 28 inches above the platform for the lower rail. What is the basis for the 2" difference? Is there evidence suggesting that 28 inches is too high? If information exists suggesting a need to lower the guardrail height ASTM F15.29 should be notified and the standard changed. Lacking any information we suggest raising the lower guardrail height to 28 inches].

Section 11.6 Other Design Considerations for Guardrails and Protective Barriers

"... the opening width providing access to other play events should not exceed 15 inches." [Slides should be exempted from this design restrictive dimension. 16 inches is the minimum width for slides for school-age children. Tandem and wide slides obviously wider than 16 inches. It is very restrictive to have a 15 inch opening when the slide is 36 or 48 inches wide. Children with leg braces or other leg disabilities will have a difficult time using a slide with a 15 inch opening This would deny many children the use of playground equipment].

Section 12.1.5 Horizontal Ladders and Overhead Rings

The spacing of rungs on overhead ladders are shown for preschool-age children and school-age children. The draft indicates that this distance does not apply to "overhead rings" and perhaps should say "overhead swinging rings" as stated in Section 3 and describing Upper Body Equipment. The proposed wording assumes that the rings are not fixed.

A distance based upon rationale should be stated for overhead swinging rings. We recommend that the distance be the same as for fixed rings. It is understood that the ring does swing in an arc about the pivot point. However, under the full weight of a child, the degree of movement is not sufficient enough to assume that the next ring is static and therefore closer. In fact, if the apparatus is in use, the adjacent unoccupied ring could very well be swinging and the reach distance could be equal or greater than fixed handholds of horizontal ladders or fixed overhead rings.

The maximum height of upper body grasping devices for school-age children should not be reduced to 78 inches from the present 84 inches. In the introduction of this document it states that "a playground should allow children to develop progressively and test their skills by providing a series of graduated challenges." Some or our members have offered horizontal ladders since 1952 (a documented fact) and users have always complained when the height of the grasping device does not allow for the free swing of the children. The overhead reach of the 95th percentile twelve year old is 78 inches and therefore this height is not a challenge and will not be used by this group. There does not seem to be rationale to make this change.

In over 45 years of selling these products, some of our members have not one single recorded accident that would preclude the use of rungs for the take-off and landing of an overhead device. There seems to be no rationale for adding this sentence to the document.

In addition, one ASTM member lowered their overhead events in their school district and found the lower height restricted the use by the intended user group resulting in raising the event back to the 84 inches. It is not the fall height of the event that causes the injuries, but rather the way children fall from the equipment.

Additional Comments on the Vertical Height: During the development of ASTM F1487-93, the committee spent a great deal of time addressing vertical height of overhead ladders. The 84" maximum height was agreed upon because it would accommodate the maximum user whose standing vertical grip height is 78.2". This does not take into account the added reach gained from shoulder extension when reaching overhead and the difference between standing flat footed and on your toes. At the time of ASTM F1487-93 being released to the public, most manufacturers had already changed their overhead ladders to accommodate the standard.

Most manufacturers supply their sales representatives with detailed drawings that explain the intent of the ASTM Standard as it applies to horizontal ladders and overhead rings. They have found that by varying the deck height and maintaining the vertical grip reach of the 5th percentile

5-year-old, they can accommodate the 5 through 12-year-old age group. Their experience over the past several years is that their customers are able to purchase and install overhead ladders that meet the intended user criteria, simply stated, they utilize lower decks with lower overhead events for the younger age group and increase in height up to the 36" maximum deck height for the older user. We encourage CPSC to consider using similar drawings and to help explain proper use of horizontal ladders and overhead rings.

Additional Comments on Rung Ladders: Mandating the elimination of a rung ladder at the end of overhead events that do not attach to decks at both ends is a mistake. It should be the owners decision whether or not to include the rung ladder. Children have been observed bringing bicycles, chairs, cement blocks, rocks, and other materials into the play environments to give them the "step-up" to reach overhead events. This situation is not desirable.

With the coming of firm, stable and slip resistant surfacing materials, which will often be a rubber matting, we can foresee many problems by mandating that the child use the overhead event and then drop to the surface. With the proposed 78" maximum height the 50th percentile five year old whose vertical reach is 49.7", will drop more than 28" to the surface below. This drop will most likely not be a perfect ten gymnastic style drop. It clearly exceeds the 18" maximum step height as prescribed by both ASTM and CPSC. Some IPEMA members have used rung ladders for access and egress for horizontal ladders and overhead rings from the very first design. Their experience shows that most of the injuries have occurred from falls to a hard or poorly maintained surface, not from falls while accessing a rung ladder. Moreover, this suggestion will eliminate traditional freestanding overhead ladders from the marketplace.

Additional Comments on the User Age: We understand the desire not to eliminate the 4-year-old from starting to utilize overhead type events. However, we caution CPSC not to suddenly interject a new age grouping of 4-12 when the traditional ASTM and CPSC age definition has been preschool children, 2-5 year olds, and school age children 5-12 year olds. We feel it would be much better to recommend that if a 4-year-old user wishes to utilize a piece of overhead equipment that supervision should be provided and that equipment design should have lower decks, with lower overhead events for this age group. As it stands today, the proposed CPSC Guideline would allow a 4-year-old user to fall or drop from the 78" high beam and we don not feel this is a good recommendation for the CPSC to make. The 4-year-old would be falling more than 30" onto a surface that we hope is maintained and resilient. This contradicts all of the guidelines for preschool children with regards to guardrails and deck heights.

In summary, we strongly urge the CPSC not to contradict ASTM F1487-95 with regards to horizontal ladders and overhead rings. We recommend that the school age children height be 84", the use or rung ladders be a choice made by the owner, and that the age group for overhead events remain 5-12 years of age.

Section 12.1.7 Climbing Ropes

We strongly oppose the proposed change to this section which states that "Climbing ropes are not recommended because of the potential hazard of strangulation." Climbing ropes and climbing in general have many positive contributions to make to a child's development. The hazard of strangulation is more than adequately dealt with by appropriate design of the climbing rope itself. Having a rope connected at both ends, as was recommended in the original CPSC Handbook, is a proven method of preventing this potential hazard.

If the concern is that possible vandalism to the rope will create the hazard, there are vandal resistant materials available to deal with this possibility (e.g., steel core polyamide rope).

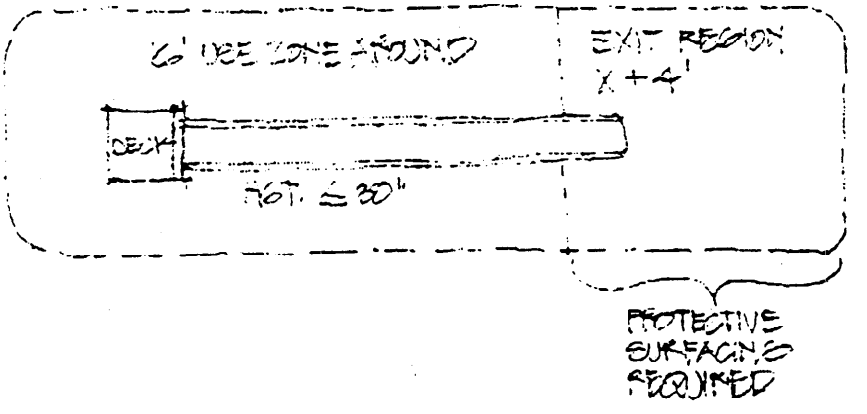
Diameter and flexibility of the rope are other factors that can be considered in eliminating the potential hazard.

We see no justification for this proposed change and fear that we are sacrificing the developmental needs of children without adequately dealing with the real issue which is to create designs which avoid the potential hazard of strangulation. A properly designed climbing rope is quite capable of avoiding this potential hazard.

Section 12.4.6 Embankment Slides

This section leaves a lot of questions unanswered. Does "eliminates the hazard of falls" mean there are no fall zone recommendations and protective surfacing is not required? What is the maximum height of the side wall above ground before it is not an embankment slide? Are tube slides treated differently?

Recommendations: Define embankment slides as slides that basically follow the contour of the ground/hillside during descent, where the maximum distance from the top of the entrance platform and the slide side wall or center of tube slides does not exceed 30" when measured perpendicularly to the ground surface. Embankment slides do not require protective surfacing within the use zone except at the exit region. See figure "X".



Rationale: This gives better definition to the term and eliminates a lot of questions currently being asked. 30" is the maximum dimension that does not require a guardrail.

Section 12.4.7 Spiral Slides, Preschool-Age Children

There is a conflict with the spiral slide restriction of one turn or less as it needs to be clarified. Does it mean 340 degrees or less, or 48 inches in height or less.

Recommendation: Remove this section from the handbook. Suggest that slides or equipment be designed for appropriate age groups with the age groups identified.

Rationale: Preschool-age children are able to use spiral type slides in a safe manner. Poor professional judgement should not restrict good products from the marketplace.

Section 12.6.2 Single-Axis Swings

We would recommend that you consider changing "unoccupied" to "occupied" and use 12" for both pre-school and school age children.

Rationale: The occupied swing is more uniform when measured this way and testing done for the IPEMA program have indicated minimal variations on the user occupying the seat. In addition, the unoccupied seat will have more variance in terms of the materials used and the natural sag after many uses. Finally, the 12" clearance was based on the expanded chest measurement of the maximum user while lying on the ground.

On Figure 21, add wording under the heading indicating where the dimensions are taken from based on the occupied seat.

Rationale: To make the CPSC document consistent with ASTM and to eliminate a 6-8" variable. We would also like to change the 33" vertical dimension for measuring D1 to 60" from the top of the protective surfacing to be consistent with ASTM and be more user friendly to people in the field.

Figure 12 Examples of More Challenging Modes of Access

The figure needs to address new guardrail/barrier requirements.

Figure 14 Typical Climbing Equipment

Remove the rungs on the ladder to platform of the overhead ladder. There is a conflict in that ASTM allows for rungs for access.

Rationale: Rung access for overhead ladders have been used on stand alone ladders for at least forty years. Injury data should support the restriction if left in the handbook.

Add a Section on Supervision

The current CPSC handbook, as well as the current draft, is missing a very important part of playground safety, and that is playground supervision. As we all know, the design, construction, installation and maintenance of the playground equipment is very important. However, all of these things cannot work cohesively if proper playground supervision is missing. In the 1981 CPSC handbook, supervision was addressed very briefly in Volume 1, Section 6 titled "Summary", found on page 11. We hope that CPSC addresses supervision in the new draft and what better time than now.

Rationale: As discussed in the Proposed Safety Standard for Public Playground Equipment developed for the CPSC by NRPA in the late 70's, supervision (or the lack of it) is probably the single most important factor in eliminating playground accidents. The rationale gave an example that gymnastic equipment commonly used indoors under very close supervision has a good history for safe use. Such equipment placed in an uncontrolled, unsupervised setting could be disastrous. In addition, John Preston made a statement in the June 1997 ASTM meeting that even though we have a good CPSC handbook (revised in 1991) and have an ASTM standard in existence since 1993, reports indicate that playground injuries are rising. It is astonishing to see this type of trend because we know that most equipment manufacturers have revised their products to incorporate the recommendations given by both the CPSC and the ASTM standards. Simply stated, playground equipment has never been as safe as it is today. If the play equipment is safer than it has ever been, then why do we see an increase in playground injuries. It is quite possible that this increase is due in part to the fact that both the current CPSC and ASTM documents do not address playground supervision.

Add to your Section on Surfacing Materials the "Engineered Wood Fiber" products. We know that you have received letters from IPEMA members The Fibar Group and Zeager Bros. detailing their concerns along with the rationale to have this type of product added to the CPSC Handbook. IPEMA supports them and their position.

AKPIRG

#70

Comments on Draft Revisions

July 10, 1997

Dear John,

I am faxing a few comments from myself and the Anchorage School District. We are not done yet, but I think it's important to get to you what we have reviewed. It's possible we won't make your deadline. I will try my best. I expect there will be other comments from around the state. I have several questions, so in some instances I will be asking instead of commenting. When I understand better those areas in question, I will follow up as quickly as I can with comments, if there is still time.

I am wondering when the revisions became so extensive? I wasn't aware that so much of the language would be changed. For example, the word shall changed to should. Where did that come from?

On page 35 of the revised document, under **12.3.6 Tot Swings** ...Full-bucket tot swing seats **are recommended** replaced the word should. Can you use the word **recommended** to replace the word(s) where shall has been changed to should? I have concerns about the word shall being changed to should. Am I just being paranoid?

4.3 Highest Accessible Part of the Equipment

Although structures that are completely enclosed have been excluded from height requirements, we believe that special attention should be paid to how climbing structures with protective barriers are measured.

School-age:

Agencies within Alaska are not using platform height as the highest accessible point. They are using railing height. Recorded injuries in Alaska do not indicate children falling from platforms with the protective barriers unless that barrier has been defeated. Recorded fall injuries in Alaska occur on climbing equipment when children climb over those barriers, or run up the outside of tube slides, and equipment with roof coverings. The highest accessible point on playground

equipment in Alaska is measured from the ground surface to the top of the railing. In other words, from where children fall.

Almost all new composite climbing equipment being installed here will have approximately a 6 foot platform height + 38 inch protective barrier height. Falls from climbing structures with this standard in place will occur from approximately 9 feet when the protective barrier has been defeated. There are slight height variances where loose fill materials are used as surfacing.
With the addition of roof heights it would be preferable to make sure over all equipment heights do not exceed what realistically can be provided as adequate protective surfacing in Arctic regions.

For free standing equipment the consensus is that a limit of 6 feet is not high enough to accommodate our conditions where snow adds several feet to surfacing in the winter. Eight feet seems to be a good compromise for free standing equipment as even in winter after snowfall there will be enough height to keep the playground challenging with out the risk of falling from excessive heights over frozen surfacing.

4.3.1 Pre-School

Four feet for highest accessible part of equipment for 2-5 year olds should not exceed 4 feet above protective surfacing. Again, are we talking about measuring from the platform height? If measuring from the guardrails the total height will be another 29 inches to top of the railing, we are now exceeding 6 feet in overall height. Which will be past the recommended 4 feet over protective surfacing (here we feel it is imperative we are all measuring from the same spot).

The horizontal ladders recommendation of 5 feet above the protective surfacing is maybe a little high for this age group. Children of this age group have limited grasping strength, thus a reasonable height limitation seems to be necessary.

If enough surfacing is added to prevent fall injury, I guess I could agree with the 5 foot recommendation. We have been less than successful in the Anchorage area in communicating this to caregivers. (OOPS John, they all told me to take this out but I could not find it in my soul to remove this thought.) These caregivers think because they are supervising that fall injury will not occur. I have a problem with this in two ways. First, supervision will not change the physics of the playground. You either have adequate surfacing for fall protection or you don't. Most don't,

and know they don't. Secondly, I am not impressed with their style of supervision or the lack of training and/or understanding that they give their staff about supervision. Most pre-school staff use this outdoor time to sunbathe, drink coffee, or read a book. They in fact are not supervising or providing the much needed playleadership so important for pre-school children.

Lastly, we don't think that adults should limit children's imaginations by assuming that equipment has to be high for this age group to facilitate creative play. What ever happened to sandboxes? I actually had a caregiver tell me they don't have sand play because children get dirty when playing in the sand. Give me a brake! I'm so glad I let my children get dirty when they were little kids.

4.3.1 Swings

Because children climb on the cross member, and there are variances in pivot points below that cross member, it would be preferable to measure the height of a swing from the cross member and not the pivot point, (again everyone needs to be on the same sheet of music). We have found some differences in the measurements of the clevis. Some are 4 inches, some are 6 inches.

Does the 8 foot maximum height recommendation for swings apply for both pre-school and school aged children?? With the differential in the actual size of the clevis and the protective surfacing used or not used, we could be approaching nine feet height. We think nine feet is too high a swing height for pre-school children. The school district still has 10 foot swings for school age. That is Ralph's limit, no higher than 10 feet for this age group.

4.5 Acceptability of Various Surfacing Materials

Loose-Fill Materials - Loose-fill materials should not be installed over hard surfaces unless daily inspection can be guaranteed to insure that the materials have not become displaced.

Not one person involved in playgrounds or playground maintenance in Alaska that I talked with could **guarantee** daily surfacing inspection. In addition, we saw in some cities within Alaska, that playground inspection forms were in fact forged to claim daily inspection compliance when in reality some surfacing issues had not been corrected in years. This resulted in injury and litigation. The general

consensus is that limited staff are already taxed, and cannot guarantee daily inspection. To tell you the truth they can't even guarantee weekly inspection.

Given the lack of support from the ruling agencies to enforce daily inspections, there are serious concerns about this recommendation. In one case pea gravel was dumped on a playground with the intention to install containment borders, this never happened. We are speaking from personal experience. The tendency of some Alaskan contractors would be to just dump loose fill on cement without installing containment borders or proper drainage. Drainage concerns **must** be taken into consideration to prevent loose fill from becoming compacted or creating standing water on the playground that will freeze into hard ice in the winter.

John, as a side note, special attention should be given to surfacing under merry-go-rounds when installed over loose fill surfacing. Nobody here does that you know? Even when it's in the manufacturers specs.

6. Layout And Design of Playgrounds

On page 11, under 6.1 (new language) When selecting a site, consideration should be given to slope and drainage, especially if loose-fill surfacing materials are going to be installed. John, could this be referenced with 4.5? This paragraph helps readers to be aware that in fact if you do install loose fill over hard surface there will need to be special attention paid to drainage issues, and how the fill will be contained.

Table 1

Critical Heights

Because of the lack of readily available information for consumers related to shock absorbing properties of bark nuggets and shredded tires consumers should be advised to contact the manufacturer for this information prior to using same. There are issues related to flammability for both of these materials that must be impressed upon the consumer.

There has been no comprehensive research project completed to test frozen surfacing in Alaska for HIC criteria. It is my hope that grant moneys can be

secured to do this research using the Tri-axil head form, and to bring it's inventor Paul Hogan to Alaska for such a project.

5. Fall Zones For Equipment

With the 72 playgrounds the Anchorage School District is responsible for we will be maintaining the 4 foot non-encroachment zones for moving equipment, we have found this to enhance supervision by providing a clear path for playleaders to walk throughout the playground to facilitate play without interfering with children's activities.

With the exception of spring rocking equipment, equipment under 24 inches in height, and the zone between adjacent swings (see below), the fall zones of adjacent pieces of equipment should not overlap. However, adjacent pieces of equipment may share a single no encroachment zone. This needs to remain for moving equipment. I have heard three different definitions for adjacent. What is your definition of adjacent? I interpret that to mean next to. But in what manner?

5.1.1 Stationary Equipment (excluding slides)

We can agree with the concept of stationary equipment over height of 30 inches having a minimum of 9 feet between structures for certain play options. For instance, pre-school children's little playhouses. But within the Anchorage School District, because of the number of children playing at any one time (100-150 children at recess) the ASD will continue to maintain the 12 foot fall zone at public school.

6.2 Locating Equipment

This section really validates the necessity of the no encroachment zones for moving equipment. Furthermore, this provides a clear unobstructed visual and traffic pattern for children to play. In addition, it facilitates supervision.

6.3 Age Separation of Equipment

We commend you for your listing of the recommendations together with the references to sections discussing different pieces of equipment. That is really good and will prove to be extremely helpful to all.

In a lot of our playgrounds we do not have the pathways, here the no encroachment zone serves as the pathway. You speak of a buffer zone, it could also include children's gardens.

7. Installation and Maintenance of Equipment

Regarding assembly and installation, we feel that this is extremely important. The post installation inspection needs to occur in the presence of the Sales Representative, Installer, Owner, Project or Risk Manager, and Playground Maintenance Cadre. This insures that there are no questions related to the installation, maintenance and care of the equipment. I know I'm dreaming here, but the ASD now actually has proper installation inspections taking place 5 times as the equipment is installed. Throughout the process. I'm convinced that a combination of some or all of these individuals involved in the total installation and inspection process produces the most successful playgrounds.

Who is a qualified person?? In our humble professional opinion, these individuals must work as a team, (one to check the other) so nothing is missed. These individuals **must** have current playground safety inspection certification, a minimum of three (3) years hands on experience with installation, maintenance, or equipment consultation.

What a wonderful idea to check local Building Code requirements, prior to installation. Right on!

10.2 Stairways and Ladders

Page 20, paragraph 2, regarding the distance between opposing interior surfaces of consecutive steps is between 3.5 and 9 inches.... space between rungs should not be between 3.5 and 9 inches. John is this the same as ASTM?? I'm confused.

11.2 Guardrails and Protective Barriers

John, I have a question about the guardrail language. Changing vertical to horizontal? Kids falling through? Could we talk about that so I can clarify what all that means? It's on Pg 23.

12.1.2 Design Considerations

The interior height of greater than 18 inches? Are you really taking that out? Does that mean the fire engine by Gametime would be ok? Does that mean monkey bars are ok?

That is as far as I have gotten. I hope these comments help. I really tried to get through everything, but I'm afraid that I have more questions than answers.

John, I want you to know how much I appreciate all the time you took to revise this very important work. Thanks for the support over the years. There is absolutely no question that Alaska's playgrounds have benefited from your expertise. They are not only safer, but more challenging. In addition, consumer's purchasing power has doubled. I think that's pretty good for 5 years work. I hope that someday you can travel to Alaska and see for yourself! I thank you for all the parents and children in Alaska.

Today I have to go look at a church playground that the Eagle Scouts installed. A man called me yesterday and is flipped out at the end product. Oh dear...

I enjoyed your call. Always great to hear from you.

Kind Regards,
Cate

Cate

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June 30, 1997

John Preston
Directorate for Engineering Sciences
CPSC
4330 East West Highway
Bethesda, MD 20814-4408

Dear Mr. Preston:

Thank you for the opportunity to review the new draft for the new Handbook for Public Playground Safety. Playground safety is a particular interest of mine and I enjoyed seeing and reviewing the draft of the new guidelines.

I have made several comments and had several questions regarding the draft. Those comments and questions are attached.

If you have any questions you can reach me at (509) 884-1511 any weekday between 8:00 and 9:00 a.m. or you can leave a message at (509) 664-5539 any time and I will get back to you.

Sincerely,

DIVISION OF ENVIRONMENTAL HEALTH

Lynda Hickok

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Environmental Health Specialist

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COMMENTS REGARDING DRAFT

HANDBOOD FOR PUBLIC PLAYGROUND SAFETY

Introduction, page 1, paragraph 3

Describe "soft contained play equipment".

4.3 Elevated Platforms, etc.

Very often barriers and/or guardrails are manufactured is such a way that a "balance beam" is created at the top of the device. If the top of a barrier or guardrail can be accessed it should be considered an accessible part of the equipment. To make the top inaccessible the enclosures around the platform should be upright rather than horizontal and the top should be rounded or angled.

Merry-Go-Rounds - A child can and will sit on that part of the equipment intended for use as a hand hold. That portion of the equipment should be considered the highest accessible point.

NOTE - Often the roof over a platform are easily accessible. Unless the roof overhangs the platform and roof supports the roof is accessible.

4.4 Equipment Which Does Not Need Protective Surfacing

The surface under basketball hoops, tether ball standards and other active play events should not be provided with loose surfacing. These surfaces should provide as secure footing as possible.

4.5 Surfacing Materials

It might be good to mention that loose surfacing material can compact at 2 or 3 inches below the surface. This is especially true following rain or snow melt. Compaction below the surface is not easily noticed and can be located only by probing below the surface.

5.1.7 Play Structures

If the fall zone is measured around the perimeter of a structure, play events such as fire poles, slides, climbers, etc. may be located very close to each other. Why does a child

need more space to fall from a free standing climber or slide or fire pole, etc. than from one attached to a structure? If anything, it would seem that falls from events on a structure would be more frequent due to the numbers of children using the structures at one time.

6.1 Choosing a Site

Would it be reasonable to mention the issue of security here? Wooded areas, solid perimeter fencing, etc. can be a very real security issue.

7.2 Maintenance

A maintenance and inspection schedule is a critical part of a maintenance plan. Without a specific schedule it is very easy to overlook items that need routine inspection. For instance, how often should S hooks be checked, how often should nuts and bolts be checked, etc?

9.7 Tripping Hazards

Describe the tripping hazard created when the difference in elevation between two adjacent surfaces is less than what a child would easily recognize as he is running from one play to another. These tripping hazards are often created when a containment is just an inch or two above the surrounding ground or the surfacing it is containing, between cement walkways and asphalt playing surfaces, new cement or asphalt installed adjacent to older surfaces, etc. Often a child is running from one location to another with his eyes on the equipment he is heading for or on another child and does not notice small differences in elevation. These tripping hazards should be either painted to become highly visible or eliminated.

(However, green and red are not easily recognized by color blind children.)

11.3 and 11.6 Guardrails and Barriers

The wording in 11.6 is much clearer than the wording in 11.3 when talking about elevated surface being exempt.

12.1.2 Design Considerations

Why remove the statement warning of the fall hazard onto the interior of equipment? Injuries from falls onto the interior bars of such equipment as "monkey bars" can be serious. Children very often use the upper bars of this type of equipment to stand, hang by the knees, and generally behave in a dangerous manner.

12.1.5 Horizontal Ladders and Overhead Rings

This section does not address the issue of bars in the exit region of horizontal ladders, though figure 14 shows no bars in the exit area. Not only does an open exit area reduce impact injuries as children dismount horizontal ladders, it discourages two children from entering the equipment at different ends at the same time and playing "chicken" when they meet in the center.

12.1.9 Layout of Climbing Components

If fall zones are maintained this section is redundant and confusing.

12.4.4 Sliding Section of Straight Slides

The description of slides with curved chutes is difficult to understand. Even figure 18 is confusing. The measurements would be difficult to determine during field inspections.

12.4.5 Exit Regions of Slides

If a child lands on his bottom as he exits a slide the 15 inch exit height will impact most 5 - 8 year olds on the back of the head or neck as he rebounds backward. A lower height would be less likely to create such an impact hazard.

12.4.7 Spiral Slides

Some consideration should be given to the distance between open chutes and supports. A child should not be able to grasp or impact chute supports as they descend the chute.

12.6.2 Single Axis Swings

Some recommendation should be given for maximum swing seat height.

12.6.4 Multi-Axis Tire Swings

There is no mention in this or the 1994 version of the handbook of the need for clearance between the bottom of a tire swing when it is closest to the support structure. When wide tires, such as racing tires, are used the 30" distance from the top of the tire is not sufficient to allow clearance for legs and feet.

Also there is no mention of the need to have the swing suspension wider at the connection to the support than at the seat. This detail can help reduce twisting of the swing during its to and fro arc and, thus, reduce the impact hazard between swim users or between a swing user and the supports.

Appendix B

Is it a good idea to encourage the use of home made templates? Four different people can get four different results from the same templates. It depends on the angle the template is put through an opening.

Appendix C and D

Excellent!!

Figure 17 Slide

A flared hood at the entrance to a slide chute would help prevent access to the top of the entrance. Children climbing to the top of slides, especially tube slides, is very common and often results in falls and cuts and tears from bolts outside the chute.

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From: Peggy Payne **Date:** 6/29/97 **Page 1 of 1**

Subject: Comments on Draft Handbook for Public Playground Safety

Below are a few comments on the Draft, revised CPSC Handbook for Public Playground Safety.

1. P. 15, Section 8.2 Hardware

This section should specifically mention that nails are not acceptable.

2. p. 25, Section 12 Major Types of Playground Equipment

This section should include recommendations on Track Rides - both for height of the handle above grade and for take off and landing areas.

3. p. 44, Appendix C, Surface Material Characteristics

Somewhere in this section, the surface materials that meet the ASTM PS 83 should be acknowledged. Accessibility should be listed as an Advantage, and if surface materials are not accessible, that should be listed as a Disadvantage.

4. p. 48, Appendix D, Description of Loose-Fill Surfacing Materials

Shredded wood fibers with the bark removed, such as Fibar or Wood Carpet, should be added to the list and described separately from the other three descriptions of wood surfaces.

Thank you for the opportunity to comment.