



Test Report

No.: SHHL2403009718PG

Date: MAR. 28, 2024

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WENZHOU DREAM GARDEN AMUSEMENT EQUIPMENT CO., LTD.
ROOM 803-1, BUILDING 1, CANGHE JINYUAN, YONGQIANGDADAO, YONGZHONG STREET,
LONGWAN DISTRICT, WENZHOU CITY, ZHEJIANG PROVINCE

THIS TEST RESULT IS COPIED FROM THE TEST REPORT No.: SHHL2401001492PG,
DATE: MAR. 28, 2024.

Sample Description : INDOOR PLAYGROUND

Source of Sample : SENT BY CLIENT.
Sample Receiving Date : JAN. 09, 2024
Testing Period : JAN. 09, 2024 TO MAR. 27, 2024

Test Requested	Result
ASTM F 1487-21: Standard Consumer Safety Performance Specification for Playground Equipment for Public Use	Pass (See Remark 3)
ASTM F 1918-21: Standard Safety Performance Specification for Soft Contained Play Equipment	Pass (See Remark 3)

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Terry Jin

Terry Jin
Authorized Signatory

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Test Conducted

ASTM F 1487-21: Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

Scope:

1. This consumer safety performance specification provides safety and performance standards for various types of public playground equipment and dimensional requirements for their clearance and use zones. Its purpose is to reduce life-threatening and debilitating injuries.
2. The range of users encompassed by this consumer safety performance specification is the 5th percentile 2-year-old through the 95th percentile 12-year-old.
3. Home playground equipment, toys, amusement rides, sports equipment, fitness equipment intended for users over the age of 12, public use play equipment for children 6 to 24 months, and soft contained play equipment are not included in this specification.
4. Products or materials (site furnishings) that are installed outside the equipment use zone, such as benches, tables, independent shade structures, and borders used to contain protective surfacing, are not considered playground equipment and are not included in this specification.
5. This specification does not address accessibility, except as it pertains to safety issues not covered in the DOJ 2010 Standard for Accessible Design.
6. Clause 1.6-1.9 details see ASTM F1487-21

Maximum user weight: / Total number of users: 11 children
Age range: 3-12 Number of tested samples: 1 pc

Clause	Test Method & Test Requirement	Rating
4	Materials and Manufacture	
4.1	General Requirements Playground equipment shall be manufactured and constructed only of materials that have a demonstrated durability in the playground or similar outdoor setting. Any new materials shall be documented or tested accordingly for durability by the playground equipment manufacturer.	N/C
4.1.1	Metals subject to structural degradation such as rust or corrosion shall be painted, galvanized, or otherwise treated. Woods shall be naturally rot- and insect-resistant or treated to avoid such deterioration. Plastics and other materials that experience ultraviolet (UV) degradation shall be protected against ultraviolet light.	N/C
4.1.2	Regardless of the material or the treatment process, the manufacturer shall ensure that the users of the playground equipment cannot ingest, inhale, or absorb any potentially hazardous amounts of substances through body surfaces as a result of contact with the equipment. All materials content shall comply with the Consumer Product Safety Improvement Act of 2008 (CPSIA) (this includes but is not limited to coating and substrate).	N/C Material test not applied
4.1.3	Wood intended for playground equipment that is not naturally rot- and insect-resistant shall be treated to resist rot and insect attack from standard procedures. Any wood not naturally rot- and insect-resistant, which has any fabrication up to 6 in. (150 mm) above, or any portion at or below the level of the protective surface of the playground, shall be treated after wood fabrication. Deviations shall have independent documentation of durability. Chromated copper arsenate (CCA), creosote,	N/C



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Clause	Test Method & Test Requirement	Rating
	pentachlorophenol, tributyl tin oxide, and surface coatings that contain pesticides shall not be used for playground equipment.	
4.2	All fasteners used to construct public playground equipment shall meet the requirements of Section 4.	Pass
4.2.1	All fasteners, connecting, and covering devices shall be inherently corrosion resistant or be provided with a corrosion-resistant coating.	Pass Indoor use
4.2.2	When installed in accordance with the manufacturer's instructions, fasteners, connecting, and covering devices shall not loosen or be removable without the use of tools. Lock washers, self-locking nuts, or other locking means shall be provided for all nuts and bolts to protect them from detachment. Hardware in moving joints shall also be secured against unintentional loosening.	Pass
4.2.3	Moving suspended elements shall be connected to the fixed support with bearings or bearing surfaces that serve to reduce friction or wear. 4.2.3.1 Steel cable that is permanently affixed to a hanger assembly performs as a bearing surface. Cable ends should be inaccessible or capped to prevent injury from frayed wires. Cables and steel-cored ropes should be protected to prevent fraying, loosening, unraveling, or excessive shifting of joints.	N/A No such design
4.2.4	Hooks and connecting devices shall be subject to the requirements of 6.4.5.	N/A No such design
4.3	Tires	
4.3.1	Tires shall not trap water.	N/A No such design
4.3.2	Tires shall not have exposed steel belts.	N/A No such design
5	General Requirements	
5.1	Playground equipment represented as complying with this consumer safety performance specification shall meet all applicable requirements specified herein. Anyone representing compliance with this specification shall keep such essential records as are necessary to document any claim that the requirements within this specification have been met.	N/C
5.2	Play equipment designed for a specific age group (2 through 5, 5 through 12, 2 through 12) shall have all play activities on that equipment meet the requirements for that age group.	Pass Age group: 3 through 12
5.3	Play structures shall be anchored to the ground or not be intended to be relocated.	Pass
5.4	Small Parts—When installed in accordance with the manufacturer's instructions, equipment for children under 3 years of age shall meet the requirements of 16 CFR Part 1501.	Pass
6	Performance Requirements	
6.1	Head and Neck Entrapment Public playground equipment shall be designed and constructed or assembled so that any accessible opening shall meet the following performance requirements to reduce	Pass



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Clause	Test Method & Test Requirement	Rating
	the risk of accidental head or neck entrapment by either a head-first or feet-first entry into the opening. Openings between the protective surfacing and the bottom edge of the equipment (that is, rails, platforms, steps, and so forth) are exempt from this requirement as indicated by Fig. A1.1.	
6.1.1	<p>Accessible Openings A completely bounded rigid opening is accessible when a torso test probe (see Fig. A1.2) can be inserted into the opening to a depth of 4.0 in. (102 mm) or more. An opening passes this test if (1) the opening does not admit the torso probe when it is rotated to any orientation about its own axis, or (2) the opening admits the torso probe and also admits the head probe. An opening fails the test if the opening admits the torso probe but does not admit the head probe.</p> <p>6.1.1.1 Test Procedure for Completely Bounded Rigid Openings—Place the torso probe (see Fig. A1.2) in the opening with the plane of the base of the probe parallel to the plane of the opening; rotate the probe to its most adverse orientation (that is, major axis of the base of the probe parallel to the major axis of opening). If the torso probe can be inserted into the opening to a depth of 4.0 in. (102 mm) or more, place the head probe (see Fig. A1.3) in the opening with the plane of the base of the probe parallel to the plane of the opening. An opening passes this test if (1) the opening does not admit the torso probe when it is rotated to any orientation about its own axis, or (2) the opening admits the torso probe and also admits the head probe. An opening fails the test if the opening admits the torso probe but does not admit the head probe.</p>	Pass
6.1.2	<p>Nonrigid Completely Bounded Openings A nonrigid opening such as may be found in but not limited to flexible nets, tarps, and plastic enclosures is considered accessible if a torso probe will penetrate the opening to a depth of 4.0 in. (102 mm) or more when tested in accordance with the test procedure outlined in 6.1.2.1 (see Figs. A1.2 and A1.3 for probe dimensions).</p> <p>6.1.2.1 Test Procedure for Completely Bounded Non-rigid Openings—Place the torso probe in the opening, tapered-end first, with the plane of its base parallel to the plane of the opening; rotate the probe to its most adverse orientation (that is, the major axis of the base of the probe parallel to the major axis of the opening); apply a force of 50 lbf (222 N) to the probe to attempt to pass it through the opening. If the base of the probe passes through the opening, place the large head probe in the opening, tapered end first, with the plane of its base parallel to the plane of the opening. Apply a force of 50 lbf (222 N) to the probe to attempt to pass it through the opening. A non-rigid opening passes the test if: (1) the opening does not allow the torso probe to be inserted so deep that the opening admits the base of the probe when it is rotated to any orientation about its own axis, or (2) the opening allows full passage of the torso probe and also allows the large head probe to pass completely through. A non-rigid opening fails the test if the opening allows full passage of the torso probe but does not admit the large head probe.</p>	Pass
6.1.3	Boundaries of Large Openings —If the opening admits the 9.0-in. (229-mm) head probe, each portion of its boundary shall be evaluated for partially bounded opening requirements of 6.1.4.	Pass



Clause	Test Method & Test Requirement	Rating
6.1.4	<p>Partially Bounded Openings:</p> <p>6.1.4.1 A partially bounded opening is considered accessible when any of the following conditions exist, and must meet the performance requirements as recommended in 6.1.4.2 and 6.1.4.3.</p> <p>6.1.4.2 If the unbounded part of a partially bounded opening is between 1.875 6 0.005 in. (47.6 mm) and 9.0 in. (229 mm) in width when measured perpendicular to each surface, the opening can be considered accessible and must meet the conditions of 6.1.4.3.</p> <p>6.1.4.3 Test Method—The “A” portion of the test template (Fig. A1.4) is to be inserted along the centerline of the opening (determine the most adverse condition) (see Fig. A1.5) so that the centerline of the template follows the centerline of the opening and the plane of the template is parallel to the plane of the opening until the motion is arrested by contact between the test template and the boundaries of the opening. By visual inspection, determine if there is simultaneous contact between the sides of the template. If simultaneous contact is made the opening is accessible and must be tested using the “B” portion of the test template (see Fig. A1.6).</p> <p>6.1.4.4 If the angle test template “A” indicates failure, check for an exempted thick surface condition by positioning the plane of the “B” portion of the test template between and perpendicular to the plane of the boundaries of the opening (see Fig. A1.7 and Fig. A1.9). If the test template fits completely within the boundaries of the opening, the opening is considered hazardous and fails the test unless it allows full passage of the 9.0-in. (229 mm) head probe (see Fig. A1.8). If the template does not fit down within the boundaries of the opening (defined as the opening outlined by the contact points of the test template “A”) the opening is not considered accessible.</p> <p>6.1.4.5 The test template is divided into two sections. Section “A” is used first to determine accessibility and is based on the Specification F1004 standard rationale. Section “B” is used to determine if the thickness of the material or the location of the opening prevents access to the opening. The thickness of 0.75 in. (19.1 mm) for the template itself is based on half of the neck depth of a 5th percentile two year old minus compression. This dimension is consistent with Specification F1004.</p> <p>6.1.4.6 Other dimensions are based on the following:</p> <ol style="list-style-type: none"> (1) 6.1 in. (155 mm) width represents 95th percentile 5 year old head width, (2) 1.875 6 0.005 in. (47.6 mm) is the neck breadth of the 5th percentile 2 year old (2.5 in. (64 mm) minus tissue compression), (3) 8.5 in. (216 mm) shoulder width of 5th percentile 2 year old, and (4) 3.0 in. (76 mm) neck length of a five year old. <p>6.1.4.7 Exemption to 6.1.4:</p> <ol style="list-style-type: none"> (1) Those partially bounded openings which are inverted. A partially bounded opening is considered inverted if the lowest interior boundary immediately adjacent to the opening is horizontal or slopes downward. (2) Partially bounded openings that form “V” angles less than 55° where the apex of the angle is formed by an inclined or vertical climbing surface and a rope, chain or cable are exempt if the rope, chain or cable are in contact with the inclined surface at or 	Pass



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	below the protective surface at the point of the formed "V" angle. (3) Partially bounded openings where simultaneous contact of the "A" portion of the template is less than 24 in. (610 mm) above the protective surfacing.	
6.2	Sharp Points and Sharp Edge There shall be no accessible sharp points or sharp edges on public play equipment.	Pass
6.2.1	All points and edges on public play equipment shall be tested for sharpness in accordance with the requirements in 16 CFR 1500.48 and 1500.49 referenced in 2.3.	Pass
6.2.2	The exposed open ends of all tubing shall be provided with caps or plugs that cannot be removed without the use of tools. Chimes, tubes, and other musical equipment is exempt from this requirement; however, the tube edges shall meet 6.2.1.	Pass
6.2.3	Suspended members, such as rings on upper body equipment and swing seats, shall have a minimum radius of 0.25 in. (6.4 mm) on corners and edges. This requirement does not apply to swing belt seats, straps, ropes, chains, connectors, and other flexible components.	N/A No such design
6.2.4	Acut-off bolt end projecting beyond the face of the nut shall be free of burrs, sharp points, and sharp edges.	Pass
6.3	Protrusions There shall be no protrusions on public play equipment. Three projection test gauges and a projection gauge are required to determine whether projections are protrusions. Their use is described in this section.	Pass
6.3.1	Accessible Projections A projection is not accessible and is not a protrusion when it is recessed or located in such a manner that will not allow any of the projection test gauges to be placed over it. Any of the conditions described in the remainder of this section constitute a protrusion hazard.	Pass
6.3.2	Determining Whether a Projection is a Protrusion Successively place each of three gauges (see Fig. A1.10) over each accessible projection in all orientations (see Fig. A1.12 and Fig. A1.13). Determine whether the projection extends beyond the face of any gauge. The projection fails the test and is a protrusion if it extends beyond the face of any of the three gauges. 6.3.2.1 Exemption to Protrusion Criteria—A manipulative device attached to a rope, cable, or chain is exempt from meeting the projection criteria using the large 3-in. (76.2 mm) interior diameter projection gauge. The use of the smaller gauges still applies.	Pass
6.3.3	Swing Seat Protrusions—Test for this condition with the suspended member in all positions of its intended travel. Keeping the projection test gauge (see Fig. A1.11) oriented vertically, and its axis parallel to the plane of travel, place it over any projection accessible throughout the path of travel. Any projection on the suspended member which extends beyond the face of the test gauge is a protrusion.	N/A No such design
6.4	Entanglement There shall be no entanglement hazards on public play equipment. Three test gauges, a feeler gauge, and the means to accurately measure a 0.12 in. (3.0 mm) extension are required to determine whether entanglement hazards exist. Any of the conditions described in this section constitutes an entanglement hazard.	Pass See Below
6.4.1	Slides The following requirements apply to slides in the areas shown in Fig. A1.14. Examples are shown in Fig. A1.15, Fig. A1.16, Fig. A1.17, and Fig. A1.23.	Pass



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Clause	Test Method & Test Requirement	Rating
	<p>6.4.1.1 A projection that meets both of the following requirements is an entanglement hazard: (1) One of the three projection gauges (see Fig. A1.10) passes over the projection and contacts the initial surface. (2) The projection extends perpendicular (65°) from the initial surface more than 0.12 in. (3.0 mm). The thickness of the projection gauge (see Fig. A1.11) may be used to measure the 0.12 in. (3.0 mm) extension.</p> <p>6.4.1.2 Slides shall be constructed in such a manner as to provide a continuous sliding surface (roller slides exempted) and shall minimize the likelihood of entanglements.</p>	
6.4.2	Projections from a Horizontal Plane—A projection that meets the conditions of 6.4.1.1 (1) and (2) and which also projects upwards from a horizontal plane (see Figs. A1.15-A1.17) is an entanglement hazard.	Pass
6.4.3	Exposed Bolt End Projections—Any accessible bolt end projecting beyond the face of the nut more than two full threads is an entanglement hazard (see Fig. A1.15(6)). A bolt end is inaccessible and not an entanglement hazard when the bolt end is recessed and the 3.5 in. (89 mm) OD projection gauge (see Fig. A1.10) cannot be made to contact the bolt end when the outside curve of the gauge is placed flat against the recessed area (see Fig. A1.18).	Pass
6.4.4	Projections Which Increase in Size—Any projection which fits within any of the three projection test gauges (see Fig. A1.10) and where the increase in size extends greater than 0.12 in. (3.0 mm) from the initial surface with a depth greater than 0.12 in. (3.0 mm) is an entanglement hazard (see Fig. A1.15).	Pass
6.4.5	<p>Connecting Devices—Connecting devices such as, but not limited to, S-hooks and C-hooks, when properly closed, are not entanglement hazards. These connectors are considered closed when there is no gap or space greater than 0.04 in. (1.0 mm) when measured with a feeler gauge (see Fig. A1.19(1)).</p> <p>6.4.5.1 S-hook connectors are subject to these further requirements. If any of the following requirements are not met, an entanglement hazard exists: (1) No portion of the closed end of an S-hook lower loop may project beyond the vertical boundary established by the upper loop (see Fig. A1.19(2)). (2) An S-hook upper loop may align with, may partially overlap, or may completely overlap the connector body. If the upper loop completely overlaps the connector body, it must not extend past the connector body (see Fig. A1.19(3)). (3) An S-hook lower loop must align with the connector body and not overlap it in any way (see Fig. A1.19(4)).</p> <p>6.4.5.2 Exemptions to 6.4.5: (1) Connecting devices that have an in-fill such as plastic or cable that completely fills the interior space of both loops preventing entry of items of clothing into the interior of the connecting device.</p>	N/A No such design
6.5	Crush and Shear Points There shall be no crush or shear points caused by junctures of two components moving relative to one another, or at an opening present at the junction of a stationary support and a rigid supporting member for a swinging element (that is, pendulum see	Pass



Clause	Test Method & Test Requirement	Rating														
	saw, glide rides, and so forth) while the swinging elements are within their normal swinging angles. A crush or shear point is any point that entraps at one or more positions a 0.62 in. (15.7 mm) diameter rod.															
6.5.1	<p>To reduce the likelihood of unintentional contact with a crush or shear point, an opening shall comply with either 6.5.1.1 or 6.5.1.2.</p> <p>6.5.1.1 An opening with a minor dimension of less than 1.0 in. (25 mm) is acceptable if a finger probe (as illustrated in Fig. A1.20), when inserted point first into an opening, cannot be made to touch any crush or shear point. The probe shall be applied in all possible articulated positions with an application force not to exceed 1 lb (4 N).</p> <p>6.5.1.2 An opening in an enclosure with a minor dimension of 1.0 in. (25 mm) or more, shall require that the crush or shear point be located at a distance as specified in Table 1 from the plane of the opening. An enclosure in this case covers a crush or shear point.</p> <p>TABLE 1 Minimum Acceptable Distance from an Opening to a Crush or Shear Point</p> <table><tr><th>Minimum Dimension of Opening,^A in. (mm), ±0.05^B</th><th>Minimum Distance from Opening to Part, in. (mm)</th></tr><tr><td>1 (25)</td><td>6.5 (165)</td></tr><tr><td>1.25 (32)</td><td>7.5 (190)</td></tr><tr><td>1.5 (38)</td><td>12.5 (318)</td></tr><tr><td>1.875 (48)</td><td>15.5 (394)</td></tr><tr><td>2.125 (54)</td><td>17.5 (445)</td></tr><tr><td>More than 2.125 (54) and less than 6 (152)</td><td>30 (762)</td></tr></table> <p>^A See 6.5.1.2.</p> <p>^B Between 1-in. and 2.5-in. (25-mm and 64-mm) interpolation is used to determine values specified in the table.</p> <p>6.5.1.3 Exemptions to 6.5:</p> <p>(1) Chain and its method of attachment,</p> <p>(2) The attachment area of heavy duty coil springs to the body and base of rocking equipment,</p> <p>(3) The area between a swinging element and a horizontal top rail, and</p> <p>(4) The area between small, lightweight moving parts necessary as an integral part of the play activity (for example, abacus beads, bell clappers, telephone receivers, etc.) provided that this area is not considered a crush or shear point as defined in 3.1.9.</p>	Minimum Dimension of Opening, ^A in. (mm), ±0.05 ^B	Minimum Distance from Opening to Part, in. (mm)	1 (25)	6.5 (165)	1.25 (32)	7.5 (190)	1.5 (38)	12.5 (318)	1.875 (48)	15.5 (394)	2.125 (54)	17.5 (445)	More than 2.125 (54) and less than 6 (152)	30 (762)	Pass
Minimum Dimension of Opening, ^A in. (mm), ±0.05 ^B	Minimum Distance from Opening to Part, in. (mm)															
1 (25)	6.5 (165)															
1.25 (32)	7.5 (190)															
1.5 (38)	12.5 (318)															
1.875 (48)	15.5 (394)															
2.125 (54)	17.5 (445)															
More than 2.125 (54) and less than 6 (152)	30 (762)															
6.6	<p>Suspended Hazards</p> <p>There shall be no single nonrigid component (cable, wire, rope, or other similar component) suspended between play units or from the ground to the play unit within 45° of horizontal, unless it is above 84 in. (2130 mm) above the protective surface.</p>	N/A No such design														
6.6.1	Rope, cable, or chain shall be fixed at both ends and not be capable of being looped back on itself, creating an inside loop perimeter greater than 5.0 in. (127 mm).	N/A No such design														
6.6.2	<p>Exemptions for Suspended Components:</p> <p>6.6.2.1 Multiple (two or more) suspended components (cables, wire, rope, or similar components) located at two or more elevations, may be suspended below 84 in. (2130</p>	N/A No such design														



Clause	Test Method & Test Requirement	Rating
	mm) when they comply with all other aspects of the single suspended component section and cannot be looped or stretched to contact another suspended component(s). 6.6.2.2 Chain or cable used to support a suspended element intended for standing or sitting that has an attachment point that moves along a designated path of travel is exempt from this requirement. Rope shall not be used as a method of suspending swings and suspended elements. (1) Suspended elements intended for standing or sitting must meet the requirements of 8.6.7. 6.6.2.3 Rope, cable, or chain with a length of 7.0 in. (178 mm) or less may be attached at one end only. Multiple lengths of such cords that can contact each other would be treated as one length of cord. 6.6.2.4 Climbing net structures shall be exempt from 6.6 but still must meet the requirements of 6.6.1. 6.6.2.5 For ground level components, ropes, chain or cable used to attach manipulative components (for example, mallet for chime panel) to play panels or similar activities shall not be longer than 24 in. (609 mm). The attachment point of the cable to the panel shall not be higher than 27 in. (686 mm) above the underlying surface. 6.6.2.6 A single suspended component can be below 84 in. (2130 mm) if it is a minimum of 1 in. (25 mm) at its widest cross section dimension and is either brightly colored or contrasts with its surrounding environment.	
6.7	Elevated Surfaces:	N/A
6.7.1	An elevated surface shall also be considered as a designated play surface if it meets both of the following conditions: 6.7.1.1 A flat surface test device 2.0 in (51 mm) long × 2.0 in (51 mm) wide and constructed of rigid material (see Fig. A1.64) shall be placed on the surface. If the entire contact face of the test device (including all four corners) connects simultaneously with the elevated surface, the underlying surface shall be considered as flat and accessible. 6.7.1.2 The accessible flat surface shall be less than 30° from horizontal.	N/A No such design
6.8	Exemptions Portions of equipment located more than 84 in. (2130 mm) above any underlying designated play surface are exempt from the requirements of Section 6.	N/A
7	Requirements for Access/Egress	Pass
7.1	Accessible Routes to a Play Structure:	N/C
7.1.1	Accessible routes within a use zone shall conform to the performance requirements of Laboratory Test Specifications F1292 and F1951. Field testing of the accessible route within the use zone shall comply with the requirements of Specification F3313.	N/C
7.1.2	Ramps, platforms, or other stationary bridges, when used to connect an elevated access from the perimeter of the playground to the play equipment, shall be exempt from the use zone fall requirements where the connection is made at the perimeter (see Fig. A1.46).	N/C
7.2	Rung Ladders, Stepladders, Stairways, and Ramps:	N/A No such design
7.2.1	Steps and rungs shall be evenly spaced within a tolerance of ±0.25 in. (±6.4 mm) and	N/A



Clause	Test Method & Test Requirement	Rating																																																																																																																							
	horizontal within a tolerance of ±2°.																																																																																																																								
7.2.2	Steps and rungs shall not trap water (that is, no standing water) and should not encourage the accumulation of debris.	N/A																																																																																																																							
7.2.3	<p>See Table 2 for access slope; tread, rung, or ramp width; tread depth; ladder rung diameter; and vertical rise.</p> <p>TABLE 2 Rung Ladders, Stepladders, Stairways, and Ramps (Access Slope; Tread, Rung, and Ramp Width; Tread Depth; Rung Diameter; and Vertical Rise, by Age of Intended User)</p> <table><tr><th rowspan="2">Type of Access</th><th colspan="3">Age of Intended User, years</th></tr><tr><th>2 through 5</th><th>5 through 12</th><th>2 through 12</th></tr><tr><td>Rung Ladders:^A</td><td></td><td></td><td></td></tr><tr><td>Slope</td><td>75 to 90°</td><td>75 to 90°</td><td>75 to 90°</td></tr><tr><td>Total ladder width^B</td><td>≥12 in. (300 mm)</td><td>≥16 in. (410 mm)</td><td>≥16 in. (410 mm)</td></tr><tr><td>Vertical rise (top of rung to top of rung)</td><td>≤12 in.^C (300 mm)</td><td>≤12 in.^C (300 mm)</td><td>≤12 in.^C (300 mm)</td></tr><tr><td>Rung diameter</td><td>0.95 to 1.55 in. (24 to 39 mm)</td><td>0.95 to 1.55 in. (24 to 39 mm)</td><td>0.95 to 1.55 in. (24 to 39 mm)</td></tr><tr><td>Stepladders:</td><td></td><td></td><td></td></tr><tr><td>Slope</td><td>50 to 75°</td><td>50 to 75°</td><td>50 to 75°</td></tr><tr><td>Tread width:</td><td></td><td></td><td></td></tr><tr><td>Single file access</td><td>12 to 21 in. (300 to 530 mm)</td><td>≥16 in. (410 mm)</td><td>16 to 21 in. (410 to 530 mm)</td></tr><tr><td>Two-abreast access</td><td>^A</td><td>≥36 in. (910 mm)</td><td>^A</td></tr><tr><td>Tread depth:</td><td></td><td></td><td></td></tr><tr><td>Open riser</td><td>≥7.0 in. (178 mm)</td><td>≥3.0 in. (76 mm)</td><td>≥7.0 in. (178 mm)</td></tr><tr><td>Closed riser</td><td>≥7.0 in. (178 mm)</td><td>≥6.0 in. (152 mm)</td><td>≥7.0 in. (178 mm)</td></tr><tr><td>Vertical rise (top of step to top of step)</td><td>≤9.0 in.^C (229 mm)</td><td>≤12.0 in.^C (305 mm)</td><td>≤9.0 in.^C (229 mm)</td></tr><tr><td>Stairways:</td><td></td><td></td><td></td></tr><tr><td>Slope</td><td><50°</td><td><50°</td><td><50°</td></tr><tr><td>Tread width:</td><td></td><td></td><td></td></tr><tr><td>Single file access</td><td>≥12 in. (300 mm)</td><td>≥16 in. (410 mm)</td><td>≥16 in. (410 mm)</td></tr><tr><td>Two-abreast access</td><td>≥30 in. (760 mm)</td><td>≥36 in. (910 mm)</td><td>≥36 in. (910 mm)</td></tr><tr><td>Tread depth:</td><td></td><td></td><td></td></tr><tr><td>Open riser</td><td>≥7.0 in. (178 mm)</td><td>≥8.0 in. (203 mm)</td><td>≥8.0 in. (203 mm)</td></tr><tr><td>Closed riser</td><td>≥7.0 in. (178 mm)</td><td>≥8.0 in. (203 mm)</td><td>≥8.0 in. (203 mm)</td></tr><tr><td>Vertical rise (top of step to top of step)</td><td>≤9.0 in.^C (229 mm)</td><td>≤12.0 in.^C (305 mm)</td><td>≤9.0 in.^C (229 mm)</td></tr><tr><td>Ramps (does not address wheelchair use):</td><td></td><td></td><td></td></tr><tr><td>Slope (vertical/horizontal)</td><td>≤1:8</td><td>≤1:8</td><td>≤1:8</td></tr><tr><td>Width:</td><td></td><td></td><td></td></tr><tr><td>Single file access</td><td>≥12.0 in. (300 mm)</td><td>≥16.0 in. (410 mm)</td><td>≥16.0 in. (410 mm)</td></tr><tr><td>Two-abreast access</td><td>≥30.0 in. (760 mm)</td><td>≥36.0 in. (910 mm)</td><td>≥36.0 in. (910 mm)</td></tr></table> <p>^A Shall not be a sole means of access on a play structure designated for children less than 5 years of age. ^B Excluding side supports. ^C Entrapment provisions apply.</p>	Type of Access	Age of Intended User, years			2 through 5	5 through 12	2 through 12	Rung Ladders:^A				Slope	75 to 90°	75 to 90°	75 to 90°	Total ladder width ^B	≥12 in. (300 mm)	≥16 in. (410 mm)	≥16 in. (410 mm)	Vertical rise (top of rung to top of rung)	≤12 in. ^C (300 mm)	≤12 in. ^C (300 mm)	≤12 in. ^C (300 mm)	Rung diameter	0.95 to 1.55 in. (24 to 39 mm)	0.95 to 1.55 in. (24 to 39 mm)	0.95 to 1.55 in. (24 to 39 mm)	Stepladders:				Slope	50 to 75°	50 to 75°	50 to 75°	Tread width:				Single file access	12 to 21 in. (300 to 530 mm)	≥16 in. (410 mm)	16 to 21 in. (410 to 530 mm)	Two-abreast access	^A	≥36 in. (910 mm)	^A	Tread depth:				Open riser	≥7.0 in. (178 mm)	≥3.0 in. (76 mm)	≥7.0 in. (178 mm)	Closed riser	≥7.0 in. (178 mm)	≥6.0 in. (152 mm)	≥7.0 in. (178 mm)	Vertical rise (top of step to top of step)	≤9.0 in. ^C (229 mm)	≤12.0 in. ^C (305 mm)	≤9.0 in. ^C (229 mm)	Stairways:				Slope	<50°	<50°	<50°	Tread width:				Single file access	≥12 in. (300 mm)	≥16 in. (410 mm)	≥16 in. (410 mm)	Two-abreast access	≥30 in. (760 mm)	≥36 in. (910 mm)	≥36 in. (910 mm)	Tread depth:				Open riser	≥7.0 in. (178 mm)	≥8.0 in. (203 mm)	≥8.0 in. (203 mm)	Closed riser	≥7.0 in. (178 mm)	≥8.0 in. (203 mm)	≥8.0 in. (203 mm)	Vertical rise (top of step to top of step)	≤9.0 in. ^C (229 mm)	≤12.0 in. ^C (305 mm)	≤9.0 in. ^C (229 mm)	Ramps (does not address wheelchair use):				Slope (vertical/horizontal)	≤1:8	≤1:8	≤1:8	Width:				Single file access	≥12.0 in. (300 mm)	≥16.0 in. (410 mm)	≥16.0 in. (410 mm)	Two-abreast access	≥30.0 in. (760 mm)	≥36.0 in. (910 mm)	≥36.0 in. (910 mm)	N/A
Type of Access	Age of Intended User, years																																																																																																																								
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Two-abreast access	≥30.0 in. (760 mm)	≥36.0 in. (910 mm)	≥36.0 in. (910 mm)																																																																																																																						
7.2.4	Ramps that are a component of a play structure and intended to provide wheelchair access shall have a horizontal run between landings not to exceed 144 in. (3660 mm) (see Fig. A1.46).	N/A																																																																																																																							
7.2.5	Landings with play components shall include space for a wheelchair user to park and play with an adjacent circulation path not less than 36 in. (910 mm) wide (see Fig. A1.46).	N/A																																																																																																																							
7.2.6	<p>Handrails</p> <p>7.2.6.1 Continuous handrails shall be provided on both sides of stairways (see 7.3.1.3 for spiral stairways), ramps, and stepladders that have more than one tread.</p> <p>(1) Exemptions—Stairways do not require handrails where protective barriers are used. Barriers on stairways must provide alternate hand support.</p> <p>7.2.6.2 Stairways or stepladders consisting of only one tread shall have handrails or alternate means of hand support on both sides.</p> <p>7.2.6.3 Handrails or other means of hand support shall be available for use at the beginning of the first step.</p> <p>7.2.6.4 Handrails shall be between 0.95 and 1.55 in. (24 and 39 mm) in diameter or maximum cross section.</p> <p>7.2.6.5 Handrail height (the vertical distance between the top front edge of a step or, if used on a ramp, the top of the ramp surface, and the top surface of the handrail above</p>	Pass																																																																																																																							



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	it) shall be between 22 and 38 in. (560 and 970 mm).	
7.3	Other Means of Access	Pass
7.3.1	<p>Spiral Stairways</p> <p>7.3.1.1 Spiral stairways shall meet the general requirements for spacing, orientation, drainage, tread width, and vertical rise specified for stairway access in 7.2.1 – 7.2.3.</p> <p>7.3.1.2 The depth of the outer edge of the tread on spiral stairways shall be 7.0 in. (178 mm) or greater on equipment for children 2 through 5 years, and 8.0 in. (203 mm) or greater on equipment for children 5 through 12 years. These depth requirements apply to spiral stairways with both open and closed risers.</p> <p>7.3.1.3 Spiral stairways shall meet the requirements specified for handrails in 7.2.6. However, when the design of the stairway does not permit handrails on both sides of the stairway, a continuous handrail shall be provided along the outside perimeter of the steps.</p>	N/A No such design
7.3.2	<p>Climbers</p> <p>7.3.2.1 Arch climbers and flexible climbers shall not be used as the sole means of access to other components of equipment intended for use by 2 to 5 year olds</p> <p>7.3.2.2 Flexible climbing components shall be securely connected at both ends. When one end is connected to the ground and the flexible component is not vertically shielding the anchoring device, the anchoring device shall be beneath the base of the minimum required depth of the protective surfacing material. Where unitary surfacing material is used, a maintenance access opening is permissible, provided that the anchoring device is not accessible when tested with the 3.50 in. (88.9 mm) O.D. projection gauge (Fig. A1.10) as in Fig. A1.18. Tensioning devices are not considered to be part of the anchoring device.</p> <p>7.3.2.3 Connections between ropes, cables, chains, or tires used as access to other components of equipment shall be securely fixed.</p> <p>7.3.2.4 Flexible components used as access to other components of equipment for use by 2 through 5-year-olds shall readily allow users to bring both feet to the same level before ascending to the next level.</p> <p>7.3.2.5 Climbers used as access shall provide a means of hand support for use while climbing.</p>	Pass
7.4	Transition from Access to Platform	Pass
7.4.1	On stairways and stepladders, there shall be a continuation of handrails from the access to the platform.	N/A
7.4.2	On accesses that do not have side handrails, such as rung ladders, arch climbers, or flexible climbers, there shall be alternate hand gripping support to facilitate the transition to the platform.	Pass
7.4.3	For rung ladders, flexible climbers, and arch climbers, the stepping surface used for final access shall not be above the designated play surface it serves.	Pass
7.5	Platforms, Landings, Walkways, Ramps, and Similar Transitional Play Surfaces	Pass
7.5.1	Platform surfaces shall be horizontal within a tolerance of $\pm 2^\circ$.	Pass
7.5.2	Platforms, landings, walkways, ramps, and similar transitional play surfaces shall not trap water and should not encourage accumulation of debris.	N/A
7.5.3	Platforms, landings, walkways, ramps, and similar transitional play surfaces that are elevated above the protective surfacing and that are accessible to wheelchairs shall provide a clear width of not less than 36 in. (910 mm). Clear width may be reduced to	N/A



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	32 in. (810 mm) for not more than 24 in. (610 mm) along the path of travel (see Fig. A1.48).	
7.5.4	Turning spaces and parking spaces provided at a transfer point on wheelchair-accessible platforms shall not overlap (see Fig. A1.47).	N/A
7.5.5	<p>Guardrails shall be provided on platforms, landings, walkways, ramps, and similar transitional play surfaces, in accordance with 6.1, 7.5.5, and 7.5.6. Guardrails shall contain no designated play surfaces. Guardrails are not intended to surround the designated play surfaces on play equipment (for example, balance beams and climbers) unless required in Section 8.</p> <p>7.5.5.1 Guardrails or protective barriers are required on elevated surfaces that are greater than 20 in. (508 mm) above the protective surfacing when intended for use by 2- through 5-year-olds, on elevated surfaces greater than 30 in. (760 mm) above the protective surfacing when intended for use by 5- through 12-year-olds, and on all elevated wheelchair accessible platforms except as specified in 7.5.5.2 and 7.5.6.3 (see Fig. A1.49).</p> <p>7.5.5.2 Guardrails shall completely surround the elevated surface except for entrance and exit openings necessary for each event.</p> <p>(1) The maximum clear opening without a top horizontal guardrail shall be 15 in. (380 mm).</p> <p>(2) Means of ascent and descent that are accessible by openings with horizontal dimensions greater than 15 in. (380 mm) shall have a minimum of one top rail of a guardrail.</p> <p>(3) Stairs, ramps, upper body components, and components that provide a transfer system (point) or entry/exit point as defined in the DOJ 2010 Standard for Accessible Design are exempt from this requirement.</p> <p>(4) Professional judgment shall be used in the design and placement of all openings on wheelchair-accessible, elevated surfaces, and a means provided to prevent wheelchairs from falling off.</p> <p>7.5.5.3 The top surface of guardrails shall have a height 29 in. (740 mm) or greater when the elevated surface is for use by 2 through 5-year-olds, and 38 in. (970 mm) or greater when for use by 5 through 12-year-olds.</p> <p>7.5.5.4 The lower edge of guardrails on elevated surfaces intended for 2 through 5-year-olds shall be no greater than 23 in. (580 mm) above the underlying equipment surface. For elevated surfaces intended for 5 through 12-year-olds, the lower edge of the guardrails shall be no greater than 28 in. (710 mm) above the underlying equipment surface.</p> <p>7.5.5.5 Wheelchair-accessible ramps less than or equal to 30 in. (760 mm) above the protective surface of the use zone, when designed for use by 2- through 5-year-olds, or less than or equal to 48 in. (1220 mm), when designed for use by 5 to 12-year-olds, shall have a handrail 26 in. to 28 in. (660 mm to 710 mm) high on each side of the ramp and conform to 7.2.6.3 and 7.2.6.4. Ramp height shall be measured at the highest point (see Fig. A1.46).</p> <p>7.5.5.6 Wheelchair-accessible ramps must have a curb projecting above the ramp a minimum of 2.0 in. (51 mm) at both edges when any of the following conditions are present (see Fig. A1.46):</p> <p>(1) Guardrails or barriers not extending to within 1.0 in. (25 mm) of the ramp surface,</p>	Pass Fully enclosed by netting



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	<p>(2) Ramps with two rails and no barrier, or</p> <p>(3) Ramps where the barrier is beyond the edge of the ramp surface.</p>	
7.5.6	<p>Protective barriers shall contain no designated play surfaces and shall minimize the likelihood of climbing. Barriers are not intended to surround the designated play surfaces on play equipment (for example, balance beams and climbers) unless required in Section 8.</p> <p>7.5.6.1 Protective barriers are required on elevated surfaces greater than 30 in. (760 mm) above the protective surfacing when intended for use by 2 through 5-year-olds, and greater than 48 in. (1220 mm) above the protective surfacing when intended for use by 5 through 12-year-olds. Ramp height shall be measured at the highest point.</p> <p>(1) On stairways, all steps greater than 48 in. (1220 mm) above the protective surfacing shall require protective barriers.</p> <p>(2) The height of the protective barrier on a step shall be the vertical distance between the top front edge of a step and the top surface of the protective barrier.</p> <p>7.5.6.2 Wheelchair-accessible ramps that require barriers shall have a handrail 26 to 28 in. (660 to 710 mm) high on each side of the ramp.</p> <p>7.5.6.3 Protective barriers shall completely surround the elevated surface except for entrance and exit openings necessary for each event.</p> <p>(1) The maximum clear opening without a top horizontal guardrail shall be 15 in. (380 mm).</p> <p>(2) Means of ascent and descent that are accessible by openings with horizontal dimensions greater than 15 in. (380 mm) shall have a minimum of one top rail of a guardrail.</p> <p>(3) Stairs, ramps, and upper body equipment are exempted from this requirement.</p> <p>(4) Professional judgment shall be used in the design and placement of all openings on wheelchair-accessible, elevated surfaces and a means provided to prevent wheelchairs from falling off.</p> <p>7.5.6.4 The top surface of protective barriers shall have a height 29 in. (740 mm) or greater when the elevated surface is for use by 2 through 5-year-olds, and 38 in. (970 mm) or greater when intended for use by 5 through 12-year-olds.</p> <p>7.5.6.5 Openings within barriers or between the platform surface and lower edge of protective barriers shall preclude passage of the torso probe (see 6.1.1).</p>	<p>Pass Fully enclosed by netting</p>
7.5.7	<p>Adjacent Platforms</p> <p>7.5.7.1 Adjacent platforms between which access is intended that have a height difference greater than 12 in. (300 mm) when intended for use by 2 through 5-year-olds, and greater than 18 in. (460 mm) when intended for use by 5 through 12-year-olds shall require an access component (see Fig. A1.21).</p> <p>7.5.7.2 Access components between adjacent platforms shall comply with the requirements of 7.4.</p> <p>7.5.7.3 Guardrail and protective barriers on adjacent platforms shall meet the requirements specified for other platforms in 7.5.5 and 7.5.6 except areas between platforms that do not permit the full barrier height. In these areas, protective infill shall be used (see Fig. A1.21).</p> <p>7.5.7.4 The upper platform of adjacent platforms, between which access is intended, shall have guardrails or protective barriers on the side adjacent to the lower platform. The height difference between adjacent platforms is used to determine if a guardrail or</p>	<p>Pass</p>



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	barrier is required. Guardrails or barriers are required on the upper platform when the height difference exceeds 20 in. (508 mm) for 2 through 5 year olds and 30 in. (760 mm) for 5 through 12 year olds. Protective barriers are required on the upper platform when the height difference exceeds 30 in. (760 mm) for 2 through 5 year olds and 48 in. (1220 mm) for 5 through 12 year olds. The guardrails or protective barriers shall meet the requirements of 7.5.5 and 7.5.6, exempting 7.5.5.1 and 7.5.6.1.	
8	Equipment	Pass
8.1	Balance Beams	N/A No such design
8.1.1	The top surface of balance beams shall be no greater than 12 in. (300 mm) above the protective surfacing when intended for use by 2 through 5-year-olds, and no greater than 16 in. (410 mm) above the protective surfacing when intended for use by 5 through 12-year-olds	N/A
8.1.2	Support posts for balance beams shall not pose a tripping hazard.	N/A
8.1.3	The fall height of balance beams shall be the distance between the highest part of the walking surface and the protective surface below	N/A
8.2	Climbers	Pass
8.2.1	Rigid rungs that are used for hand support during ascent and descent of climbing apparatus shall be between 0.95 in. (24.1 mm) and 1.55 in. (39.4 mm) in diameter and shall not twist/rotate about its own axis. Flexible components (that is, rope, cable, chain) used as handgripping components shall be between 0.62 and 1.55 in. (16 and 39.4 mm) in diameter.	N/A No such design
8.2.2	Flexible components (for example, nets, chains, tires, and so forth) of stand-alone climbing structures shall meet the same requirements as those specified in 7.3.2 for components that provide access to or linkage between structures.	N/A No such design
8.2.3	The fall height of climbers used for access/egress from or to composite play structures shall be the distance between the highest part of the climber intended for foot support and the protective surface below.	Pass
8.2.4	The fall height of free standing climbers (e.g., geodesic domes, free standing climbing walls) shall be the distance between the highest part of the climbing component and the protective surface below.	Pass
8.2.5	3-Dimensional Climbing Net Structure: 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 in. (1829 mm) and a diameter greater than 18 in. (457 mm) for climbing net intended for 2 through 5-year-olds, and a diameter greater than 20 in. (508 mm) for climbing nets intended for 5 through 12-year-olds. (See Fig. A1.54.) 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 with an overall height greater than 72 in. (1829 mm) shall be 72 in. (1) The exterior fall height shall be the distance from the protective surfacing to the highest point at which a rigid vertical device contacts the climbing net structure when moved around the perimeter. (See Figs. A1.55-A1.57.) (2) The interior fall height shall be the distance between the protective surfacing and the highest member where there is a clear vertical path to the protective surfacing with	N/A No such design



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	a diameter of 18 in. (457 mm) for climbing nets intended for 2 through 5-year-olds, and with a diameter of 20 in. (508 mm) for climbing nets intended for 5 through 12-year-olds. (See Figs. A1.55-A1.57.)	
8.3	Upper Body Equipment	N/A No such design
8.3.1	The center-to-center distance between rungs on upper body equipment with fixed handholds shall be no greater than 15.0 in. (381 mm). 8.3.1.1 Rigid surfaces of all handgrip devices on upper body equipment shall be between 0.95 in. (24.1 mm) and 1.55 in. (39.4 mm) in diameter and shall not twist/rotate about its own axis.	N/A
8.3.2	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 in. (250 mm). 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 in. (200 mm) but no greater than 10 in. (250 mm).	N/A
8.3.3	The maximum height of upper body devices for use by 2 through 5-year-olds shall be no greater than 60 in. (1524 mm), measured from the center of the grasping device to the top of the protective surfacing below. The maximum height of upper body devices for use by 5 through 12-year-olds shall be no greater than 84 in. (2130 mm). Upper body equipment intended for users in wheelchairs shall have grasping devices no greater than 54 in. (1370 mm) above the accessible surface (see Fig. A1.50).	N/A
8.3.4	The maximum height of the take-off/landing structure for upper body equipment shall be no greater than 18 in. (460 mm) above the protective surfacing on equipment for 2 through 5-year-olds, and no greater than 36 in. (910 mm) above the protective surfacing on equipment for 5 through 12-year-olds.	N/A
8.3.5	For moveable hanging rings and hanging rungs, the distance between the uppermost pivot and the bottom of the handgrip device shall be no greater than 15.0 in. (381 mm). Any flexible elements (chain, cable, connectors such as "S" hooks, and so forth) used to suspend the ring or rung, shall have a total length no greater than 7.0 in. (178 mm) (see Fig. A1.30 and Fig. A1.52).	N/A
8.3.6	The fall height of upper body equipment shall be the distance between the highest part of the equipment and the protective surface below. Equipment support posts with no designated play surfaces are exempt from this requirement.	N/A
8.4	Sliding Poles:	N/A No such design
8.4.1	Clearance distances from structures to the pole shall be between 18 in. (460 mm) and 20 in. (508 mm).	N/A
8.4.2	When accessed from a platform, access to the sliding pole shall be from one height only.	N/A
8.4.3	A sliding pole accessed from a platform shall rise 60 in. (1524 mm) or greater above the surface of the platform.	N/A
8.4.4	The pole shall be no greater than 1.9 in. (48 mm) in diameter.	N/A
8.4.5	The sliding portion of the sliding pole shall be continuous, with no protruding welds, joints or abrupt changes in direction.	N/A



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8.4.6	The guardrail or protective barrier at a platform entrance/exit opening shall have an opening with a maximum horizontal dimension of 15 in. (380 mm).	N/A
8.4.7	The fall height of sliding poles shall be 60 in. (1524 mm) below the highest portion of the pole to the protective surfacing below.	N/A
8.5	Slides	Pass
8.5.1	Accesses to slides shall meet the same requirements as those for playground equipment in general, as specified in Section 7 (embankment slides excepted).	Pass
8.5.2	Slide Transition Platforms 8.5.2.1 Slide transition platforms shall meet the same requirements for orientation, drainage, guardrails, and protective barriers specified for platforms on other playground equipment in 7.5. 8.5.2.2 The depth of the transition platform on slides shall be 14 in. (360 mm) or greater. 8.5.2.3 The transition platform shall have a width equal to or greater than the width of the sliding chute at the entrance	Pass
8.5.3	Slide Chute Entrance 8.5.3.1 Handrails or other means of hand support shall be provided at the slide chute entrance to facilitate the transition from standing to sitting. 8.5.3.2 At the slide chute entrance, there shall be a means to channel the user into a sitting position (for example, guardrail, hood, and so forth).	Pass
8.5.4	Slide Chute 8.5.4.1 The height/length ratio of the sliding surface shall not exceed 0.577. For spiral slides and other curved slides, the length shall be measured as the horizontal projected path of the user. (See Fig. A1.22.) 8.5.4.2 No span of the sliding surface shall have a slope that exceeds 50°. 8.5.4.3 The slide chute inside width shall be 12 in. (300 mm) or greater for 2 through 5-year-olds, or 16 in. (410 mm) or greater for 5 through 12-year-olds. 8.5.4.4 Slides with flat, open chutes shall have sidewalls with a height 4.0 in. (102 mm) or greater, that extend along both sides of the chute for the entire length of the sliding surface. 8.5.4.5 Straight slides may have a chute with a circular, semicircular, or curved cross section, provided that: (1) the height of the sidewall is 4.0 in. (102 mm) (y) or greater when measured at right angles above a horizontal line (x) that is 12.0 in. (305 mm) long when intended for 2 through 5-year-olds or 16.0 in. (406 mm) long when intended for 5 through 12-year-olds (see Fig. A1.23), or (2) the vertical sidewall height (H) of such slides are a minimum of 4.0 in. (102 mm) minus 2 times the width of the bedway (W) divided by the radius (R) of the bedway curvature, as follows (see Fig. A1.24): $H(\text{in.}) = 4 - \left(\frac{2W}{R} \right)$ 8.5.4.6 All slides with a curved cross section shall minimize the likelihood of lateral discharge (for example, spiral slides and other slides that change in horizontal direction; slides with a wide, shallow chute; and so forth). 8.5.4.7 The internal diameter of tube slides shall be 23 in. (580 mm) or greater.	Pass
8.5.5	Exit Region 8.5.5.1 Slides shall have an exit region length of 11 in. (280 mm) or greater (see Fig.	Pass



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	<p>A1.25).</p> <p>8.5.5.2 The slope of the exit region shall be between 0 and -10° as measured from a plane parallel to the underlying surface (see Fig. A1.25).</p> <p>8.5.5.3 For slides with an elevation of no greater than 48 in. (1220 mm), the height of the exit end of the sliding surface shall be no greater than 11 in. (280 mm) above the protective surfacing. For slides with an elevation greater than 48 in. (1220 mm), the height of the exit end of the sliding surface shall be between 7 in. (180 mm) and 15 in. (380 mm) above the protective surfacing (see Fig. A1.26, Note 1).</p> <p>8.5.5.4 The radius of curvature of the sliding surface in the exit region shall be 30 in. (760 mm) or greater (see Fig. A1.25).</p> <p>8.5.5.5 Slide exit edges shall be rounded or curved.</p>	
8.5.6	<p>Slide Clearance Zones</p> <p>8.5.6.1 A clear area, free of equipment, shall surround the slide chute. This area is defined by Fig. A1.27 (top illustration). Portions of slides containing hoods or other devices to channel the user into a seated position, spiral slides, and tube slides are exempt. The clear area shall extend through the slide exit clearance zone.</p> <p>8.5.6.2 Spiral slides with open chutes shall maintain a clear area, free of equipment, as defined by Fig. A1.27 (bottom illustration). The clear area shall extend through the slide exit clearance zone.</p>	Pass
8.5.7	The fall height of slides shall be the distance between the slide transition platform and the protective surface below	Pass
8.5.8	<p>Embankment Slides</p> <p>8.5.8.1 The bottom of the slide chute on embankment slides shall be no greater than 12 in. (305 mm) above the surrounding ground surface inside the slide clearance zone. See Fig. A1.63.</p> <p>8.5.8.2 The platform, sitting section, or slide entry of an embankment slide shall meet the requirements of 8.5.2.</p> <p>8.5.8.3 Embankment slides shall meet the requirement of 8.5.3 – 8.5.6.</p> <p>8.5.8.4 The fall height of an embankment slide in the slide exit use zone shall be a minimum of 40 in. (1016 mm).</p>	N/A
8.6	Swings:	N/A
8.6.1	<p>Placement</p> <p>8.6.1.1 Swings shall be located away from other play structures and circulation areas. (Also see 9.4.1.)</p> <p>8.6.1.2 Swings shall not be attached to a composite play structure.</p>	N/A
8.6.2	<p>Support Structure</p> <p>The support structure shall be designed to discourage climbing and shall have no designated play surfaces.</p>	N/A
8.6.3	<p>Hangers</p> <p>Hangers shall have bearings, bushings, or other means of reducing the friction and wear of all moving parts and surfaces at the pivot point when moving in the intended direction of travel.</p>	N/A
8.6.4	<p>Suspended Elements</p> <p>8.6.4.1 Suspended elements shall be smoothly finished with blunt or rounded edges and shall conform to 6.2.</p> <p>8.6.4.2 Suspended elements shall not impart a peak acceleration in excess of 100 g</p>	N/A



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	<p>and shall have a HIC score not to exceed 500 when tested in accordance with impact attenuation requirements in 8.6.7.</p> <p>(1) Materials subject to loss of impact attenuation shall be addressed by the manufacturer per maintenance requirements found in 13.1.</p> <p>8.6.4.3 Any part of a swing which is a minimum of 84 in. (2134 mm) above the protective surface at its lowest point in use is exempt from the impact requirements.</p> <p>8.6.4.4 No more than two suspended elements shall be located within a swing bay. There shall be no limit on the number of bays provided in a single structure.</p> <p>8.6.4.5 Only one multiple occupancy suspended element shall be mounted within a swing bay. There shall be no limit on the number of bays provided in a single structure.</p>	
8.6.5	<p>Clearances</p> <p>8.6.5.1 Single Axis Swings</p> <p>(1) Unless otherwise specified, when testing for clearances, flexible elements such as belt seats which change shape during use shall be occupied either by the maximum number of designated users or a test device. Applied load shall be 120 lb (55.4 kg) with a seated hip breadth of 13.1 in. (333 mm) per user.</p> <p>(2) The horizontal distance between adjacent suspension elements at rest shall be no less than 24 in. (610 mm) when measured at 60 in. (1524 mm) above the protective surface (see Fig. A1.28).</p> <p>(3) The horizontal distance between the supporting structure and the adjacent suspension elements (that is, chain or cable) or suspended elements (that is, seat), whichever is closer, shall be no less than 30 in. (762 mm) when measured at 60 in. (1524 mm) above the protective surface. Swings consisting of only one suspended element (single or multi-user) per structural bay are exempt from this requirement when the lateral movement of the suspended element is limited such that there is no potential to impact the support structure, and a 30 in. (762 mm) minimum clearance is maintained between the suspended element and the support structure when measured 24 in. (607 mm) above the top surface of the suspended element. See Fig. A1.28.</p> <p>(4) The horizontal distance between the points where single axis swings attach to the hangers shall be greater than the width of the suspended element when occupied either by the minimum user or a test device, both having the following characteristics: 24.4 lb (11.3 kg) with a seated hip breadth of 6.7 in. (170 mm), but shall not be less than 20 in. (508 mm).</p> <p>(5) The vertical distance between the underside of a suspended element and the protective surface shall be no less than 24 in. (610 mm) for enclosed swing seats, and no less than 12 in. (305 mm) for all other elements.</p> <p>8.6.5.2 Multi Axis Swings:</p> <p>(1) Clearance Zone—The unobstructed clearance zone required for the suspended element is a cylindrical unobstructed zone centered on the pivot point of the swing with a radius equal to Y + 30 in. (762 mm) whose cylinder length is from the top of the protective surface to the pivot point of the swing with Y as shown in Fig. A1.29.</p> <p>(2) Underseat Clearance—The vertical distance between the underside of the suspended element and the protective surface of the use zone shall never be less than 12 in. (305 mm) regardless of occupancy conditions.</p> <p>8.6.5.3 Combination Swings</p> <p>Dynamic motion of the suspended element(s) may be influenced by the movement of</p>	N/A



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	the frame or other suspended elements (that is, seat), or both. Dynamic motion of the suspended elements must meet the following criteria when in use: (1) Underseat Clearance—The vertical distance between the underside of the suspended element and the protective surfacing of the use zone shall never be less than 12 in. (305 mm). (2) Clearance Zone—The suspended element shall not come within 30 in. (762 mm) of any support structure or other suspended element through its dynamic range of motion during use.	
8.6.6	The fall height of swings shall be the vertical distance between the pivot point and the protective surface of the use zone.	N/A
8.6.7	Suspended Element Impact Attenuation Testing—This test is intended to be performed by the manufacturer or test laboratory under controlled conditions. Field testing is permitted provided it is performed by qualified personnel and all testing criteria for conditions are met. 8.6.7.1 Principle—Suspended elements are raised and allowed to swing to strike a test mass. The signal emitted by an accelerometer during each impact is processed to determine the peak value of acceleration and the HIC score. 8.6.7.2 Test Apparatus: (1) Test Device—Components as described below, arranged per Fig. A1.60. (2) Test Mass—Test mass shall consist of an aluminum sphere or hemisphere with a diameter of 6.3 in. 6 0.188 in. (160 mm 6 5 mm), mass 10.1 lb 6 0.1 lb (4.6 kg 6 0.05 kg), and surface roughness less than 0.001 in. (25 µm) such that the impacting part between the surface struck and the accelerometer is homogeneous and free from voids. (3) Accelerometer—The accelerometer shall be mounted at the centre of gravity of the test mass (8.6.7.2(2)) assembly with the sensitive axis aligned to within 2° of the direction of travel of the test mass, capable of measuring acceleration triaxially. (4) Test Mass Suspension System—Chains, two ¼ in. (6 mm) gauge, of equal length suspended from pivots 24 in. (610 mm) apart at the approximate height of the bearings of the suspended element (8.6.7.2(2)). (5) Instrumentation—Specifications for accelerometer, data acquisition, and analysis shall be in accordance with the current revision of Specification F355. 8.6.7.3 Procedure: (1) Hang the suspended element using standard attachment methods (chain, cable, etc.) as specified by the manufacturer to produce the most adverse condition in which the product is used. Testing shall be performed at 72 °F 6 5 °F. NOTE 2—Higher beam heights, using coated chain or stiffer suspension elements will produce higher impact results. (2) Arrangement of Test Device—Arrange the test device so that the most adverse leading edge of the suspended element just touches the leading edge of the test mass in its at-rest position. (3) Raising Suspended Element for Test: (a) Raise the suspended element along its arc of travel until the suspension element (that is, chain, etc.) forms an angle of 60° from its at-rest position (see Fig. A1.60). (b) When the suspended element is suspended from chains etc., some curvature will be produced in the suspending elements. Adjust the seat position to determine the	N/A



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	<p>curvature which provides a stable trajectory.</p> <p>(c) Exercise caution to prevent damage to the test equipment. Where there is any possibility of the accelerometer range being exceeded, it is recommended that preliminary tests be made at lower angles (for example, 10°, 20° and 30°). If there is doubt concerning the suspended element trajectory or stability, the test mass or guidance structure, or both, it is recommended that trial releases be made without impacting the test mass.</p> <p>(d) Some elements of a flexible nature will require a brace to maintain its configuration during the test procedure. This brace should be mounted between the attachment points and form a dimension of 13.1 in. (333 mm) across at the attachment points. The mass of the brace should not exceed 10 % of the mass of the seat.</p> <p>(4) Support and Release of the Suspended Element— Support the element in the raised position by a mechanism that provides release without the application of external forces which would disturb the trajectory of the suspended element. Ensure that the seat and suspending elements are motionless. Release the element so that the assembly travels in a smooth downward arc without any visible oscillations or rotations of the element which would prevent it from striking the test mass at the impact point.</p> <p>(5) Collection of Data—Once satisfactory system operation and calibration are obtained, collect data for 10 impacts. Measure the peak acceleration and HIC for each impact. Time between each impact shall be 1.5 min 6 30 s.</p> <p>(6) Peak Acceleration and HIC—Record the peak acceleration and HIC as the mean value from the 10 impacts.</p> <p>8.6.7.4 The manufacturer shall designate the maximum height of the pivot point at which the suspended element meets the requirements as specified in 8.6.4.2.</p> <p>Applicable requirements for the suspended elements shall also be included.</p>	
8.7	<p>Swinging Gates and Doors</p> <p>Swinging gates and doors shall meet the requirements for vertical rotating equipment found in 8.8.</p>	N/A
8.8	<p>Vertical Rotating Equipment</p> <p>Equipment that rotates about an axis which is greater than 45° from horizontal</p>	N/A
8.8.1	<p>General Configuration</p> <p>8.8.1.1 Hand support shall be provided to help children maintain their balance and provide a secure means of hanging on, or the area in which the children sit shall be concave or tub like to contain the user to reduce the likelihood of ejection.</p> <p>8.8.1.2 Equipment with a maximum dimension greater than 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter shall have a perimeter that is approximately circular. The difference between the minimum and maximum radii shall not exceed 2 in. (50 mm) (see Fig. A1.31). Any component extending beyond the outer perimeter shall be designed to minimize the likelihood of hazardous impact during use.</p> <p>8.8.1.3 Equipment with a maximum dimension less than or equal to 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter may be non-circular in shape.</p> <p>8.8.1.4 Equipment designed for climbing shall also meet the requirements in 8.2.</p> <p>8.8.1.5 Platforms Flush to the Protective Surfacing</p> <p>There shall be no gap greater than .312 in. (7.9 mm) measured in any direction</p>	N/A



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	<p>between the platform and protective surfacing.</p> <p>8.8.1.6 Rigid Platforms Not Flush to the Protective Surfacing The underside of the equipment shall be free from abrupt changes that are rigid and hang below the overall thickness of the platform. The clearance between the equipment and the protective surfacing shall be between 2.38 and 3.50 in. (60.5 and 88.9 mm) or greater than 9.0 in. (228.6 mm) unless a protective skirt is provided. When a protective skirt is provided, it shall be smooth and continuous, tapered towards the axis of rotation to a clearance between 2.38 and 3.50 in. (60.5 and 88.9 mm) or greater than 9.0 in. (228.6 mm) at the lowest point.</p> <p>8.8.1.7 Equipment with a maximum dimension greater than 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter shall be designed and constructed to minimize the likelihood of hazardous impact by any rigid members, and provide clearance to the protective surfacing material should the user fall or pass through the interior of the equipment during use.</p> <p>8.8.1.8 Equipment with a reducing plane of rotation shall maintain a minimum clearance of 9 in. (229 mm). See Fig. A1.61.</p> <p>8.8.1.9 Equipment with a maximum dimension less than or equal to 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter are exempt from requirements 8.8.1.6 and 8.8.1.8.</p> <p>8.8.1.10 Clearance Zone Rotating equipment shall have a clear area free of rigid structural components of 72 in. (1829 mm) as defined in Fig. A1.62. Rotating equipment shall have a clear area free of rigid and non-rigid components such as but not limited to cables, netting, and belting of 21 in. (533 mm) as defined in Fig. A1.62. Rotating upper body equipment with a maximum dimension less than or equal to 20 in. (508 mm) measured from the axis of rotation to the outermost perimeter is exempt from the clearance zone requirement.</p>	
8.8.2	<p>Oscillation Equipment shall not be provided with an oscillatory (up and down) motion</p>	N/A
8.8.3	<p>Speed Limitations Equipment requiring speed limitation shall be constructed to limit their maximum speed to one of the following formulas, where D equals diameter in feet, and V equals peripheral velocity in ft/s.</p> <p>8.8.3.1 Velocity, $V = 4.012 \times \sqrt{D}$.</p> <p>8.8.3.2 Revolutions per minute, $r/min = 76.632/\sqrt{D}$.</p> <p>8.8.3.3 Equipment with a maximum dimension less than or equal to 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter are exempt from the speed limitation requirements.</p> <p>8.8.3.4 Equipment with a maximum dimension greater than 20 in. (508 mm) measured from the axis of rotation to the outermost perimeter which also possess a 108 in. (2743 mm) use zone are exempt from speed limitation requirements (see Fig. A1.33).</p>	N/A
8.8.4	The fall height of vertical rotating equipment shall be the distance between the highest designated play surface and the protective surface below.	N/A
8.9	Roller Slides	N/A
8.9.1	Roller slides shall meet the specified requirements for slides in 8.5.	N/A
8.9.2	There shall be no crush, shear, entrapment, entanglement, or catch points between the junctures caused by two or more components.	N/A



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	8.9.2.1 A crush, shear, entrapment, or catch point is any point that will admit a $\frac{3}{16}$ in. (5 mm) diameter neoprene rod at one or more positions, either between rollers or adjacent stationary segments.	
8.9.3	The neoprene rods shall have a hardness reading between 50 and 60 as determined by a Type A durometer in accordance with Test Method D2240	N/A
8.9.4	The fall height of roller slides shall be the distance between the slide transition platform and the protective surface below.	N/A
8.10	Seesaws	N/A
8.10.1	Fulcrum seesaws (also known as teeter totters) shall not be on a playground designated for children less than 5 years of age unless they are equipped with a spring centering mechanism to minimize abrupt contact with the underlying protective surface should one child choose to dismount.	N/A
8.10.2	Shock-absorbing material, such as automobile tires, should be embedded in the underlying protective surface beneath the ends of fulcrum seesaws, or secured to the underside of each occupant position. As an alternative, seesaws may be equipped with a spring centering mechanism to minimize the risk of injury due to abrupt contact with the protective surface. Such a mechanism shall comply with the general requirements for crush and shear points in 6.5.	N/A
8.10.3	The fulcrum of fulcrum seesaws shall comply with the general requirements for crush and shear points in 6.5.	N/A
8.10.4	Each occupant position shall be provided with handgrip(s) that comply with the general requirements for protrusions (see 6.3). 8.10.4.1 Handgrip(s) shall not turn, rotate, or twist. Handgrip(s) intended to be gripped by one hand shall have a minimum length of 3.0 in. (76 mm). Handgrip(s) intended to be gripped by two hands shall have a minimum length of 6.0 in. (152 mm). Handgrip(s) shall not protrude beyond the sides of the seat on fulcrum seesaws.	N/A
8.10.5	Fulcrum seesaws shall not be equipped with footrests unless they have a spring centering mechanism to minimize the risk of injury due to abrupt contact with the underlying protective surface.	N/A
8.10.6	Seesaws shall be constructed so that the maximum attainable angle between a line connecting the seats and the horizontal is 25° and the maximum attainable seat height is 60 in. (1524 mm) above the level of the protective surface.	N/A
8.10.7	The fall height of seesaws shall be the distance between the maximum height attainable by any part of the seesaw and the protective surface below.	N/A
8.11	Spring Rocking Equipment	N/A
8.11.1	Seats shall be designed to minimize the likelihood of use by more than the intended number of users.	N/A
8.11.2	Each seating position shall be provided with a handgrip(s) that comply with the general requirements for protrusions (see 6.3) and for hand gripping components (see 7.2.6.4). Handgrips intended to be gripped by one hand shall have a minimum length of 3.0 in. (76 mm). Handgrips intended to be gripped by both hands shall have a minimum length of 6.0 in. (152 mm).	N/A
8.11.3	Footrests shall be provided that have a minimum width of 3.5 in. (89 mm) and shall conform to the general requirements for protrusions (see 6.3).	N/A
8.11.4	Spring mechanisms shall conform to the general requirements for crush and shear	N/A



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	points (see 6.5) when the equipment is operated by a maximum user (120 lb) (54 kg).	
8.11.5	After installation, the height of the seat, while unloaded and at rest, shall not be less than 14 in. (360 mm) and not more than 28 in. (710 mm) above the protective surface.	N/A
8.11.6	The fall height of spring/rocking equipment shall be the distance between the maximum height of the seat or designated play surface and the protective surface below.	N/A
8.12	Horizontal Rotating Equipment (Example Log Rolls) Equipment that rotates about an axis which is less than or equal to 45° from horizontal.	N/A
8.12.1	Horizontal rotating equipment intended to be stood upon shall provide hand gripping component(s) to aid in mounting and dismounting, and maintaining balance while in use. Hand gripping components shall be between 0.95 in. (24 mm) and 1.55 in. (39 mm) in diameter.	N/A
8.12.2	Horizontal rotating equipment shall not be on a playground designated for children less than 5 years of age.	N/A
8.12.3	The highest point of the top surface of horizontal equipment intended to be stood upon shall be no greater than 18 in. (460 mm) above the protective surfacing.	N/A
8.12.4	The fall height of horizontal rotating equipment shall be the distance between the highest designated play surface and the protective surface below.	N/A
8.13	Trolley Rides	N/A
8.13.1	Upper Body Type Trolley Rides: 8.13.1.1 Upper body type trolley rides shall not be on a playground designated for children less than 5 years of age. 8.13.1.2 The lowest portion of the hand gripping component shall be a minimum of 64 in. (1626 mm) above the protective surfacing when measured in the loaded condition in 8.13.5.1. 8.13.1.3 The maximum height of the hand gripping component shall not exceed 78 in. (1981 mm) above the protective surfacing when the mechanism travels along a track or other rigid designated path. 8.13.1.4 The maximum height of the hand gripping component shall not exceed 96 in. (2438 mm) above the protective surfacing when the mechanism travels along a cable or other non-rigid designated path. This shall be measured in the unloaded condition. 8.13.1.5 The hand gripping component shall comply with 8.3.1.1.	N/A
8.13.2	Seated Type Trolley Rides: 8.13.2.1 Seated type trolley rides shall be located away from other play structures and circulation areas. (Also see 9.4.1.) 8.13.2.2 Seated type trolley rides shall not be attached to a composite play structure. 8.13.2.3 Underseat Clearance—The vertical distance between the underside of the suspended element and the protective surfacing of the use zone shall never be less than 12 in. (305 mm). This shall be measured in the loaded condition in 8.13.5.1 (see Fig. A1.66). 8.13.2.4 Suspended elements shall be smoothly finished with blunt or rounded edges and shall conform to 6.2. 8.13.2.5 Suspended elements shall not impart a peak acceleration in excess of 100 g and shall have a HIC score not to exceed 500 when tested in accordance with impact attenuation requirements in 8.6.7. (1) If the maximum speed of the user as determined by 8.13.5 exceeds the speed of the suspended element upon striking the test mass when tested to 8.6.7, then the	N/A



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	<p>procedure of 8.6.7 shall be modified so the speed of the suspended element upon striking the test mass is greater than or equal to the maximum speed of the user. Examples of modifications to the procedure of 8.6.7 includes, but are not limited to, testing with longer suspension elements or controlling the speed of the suspended element along the designated path upon striking the test mass.</p> <p>(2) Materials subject to loss of impact attenuation shall be addressed by the manufacturer per maintenance requirements in 13.1.</p> <p>8.13.2.6 Any part of a suspended element which is a minimum of 84 in. (2134 mm) above the protective surface at its lowest point in use is exempt from the impact requirements.</p> <p>8.13.2.7 Suspended elements which are loops or rings intended for standing shall not be used.</p>	
8.13.3	<p>Take-off and Landings:</p> <p>8.13.3.1 Landings, including elevated platforms when provided, shall include a clear space with a minimum length of 36 in. (914 mm) and a minimum width of 32 in. (813 mm). See Fig. A1.67.</p> <p>8.13.3.2 Take-off and landings platforms when provided for upper body type trolley rides shall comply with the requirements in 8.3.4.</p> <p>8.13.3.3 End stops shall be able to absorb the energy of the trolley mechanism at a speed of 11.5 ft/s (3.5 m/s) when loaded to 8.13.5.1. This test is intended to be performed by the manufacturer or test laboratory under controlled conditions. Field testing is permitted provided it is performed by qualified personnel and all testing criteria for conditions are met. After conducting the test there shall be no visible crack or breakage of any component and no form of permanent deformation of any component that may adversely affect the structural integrity or safe use of the equipment.</p>	N/A
8.13.4	<p>Speed of User:</p> <p>8.13.4.1 The maximum speed of the user shall not exceed a running speed of 16.4 ft/s (5.0 m/s) when tested in accordance with the method for determining speed in 8.13.5.</p> <p>8.13.4.2 For upper body type trolley rides the speed of the user shall not exceed 6.7 ft/s (2.0 m/s) at the landing when tested in accordance with the method for determining speed in 8.13.5. For seated type trolley rides the maximum angle attained by the suspended element at the landing area shall not exceed 45° as shown in Fig. A1.66.</p> <p>8.13.4.3 Trolley rides that travel along a path in a horizontal plane do not need to be tested for speed.</p>	N/A
8.13.5	<p>Method for Determining Speed—This test is intended to be performed by the manufacturer or test laboratory under controlled conditions. Field testing is permitted provided it is performed by qualified personnel and all testing criteria for conditions are met.</p> <p>8.13.5.1 Load the seat or grip with 330 lb (150 kg) approximately where the user is intended to be positioned.</p> <p>8.13.5.2 At the take-off location, raise the suspended element along its arc of travel until the suspension element (that is, chain, etc.) forms an angle of 30° from its at-rest position. In circular designs when no specific start or stop is present, the suspended element shall be raised at the highest point of the track or cable.</p> <p>8.13.5.3 When the suspended element is suspended from chains, etc., some curvature</p>	N/A



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	<p>will be produced in the suspending elements. Adjust the seat position to determine the curvature which provides a stable trajectory.</p> <p>8.13.5.4 Support the element in the raised position that provides release without the application of external forces which would disturb the trajectory of the suspended element. Ensure that the seat and suspending elements are motionless. Release the element so that the assembly travels in a smooth downward arc without any visible oscillations or rotations of the element which would prevent it from determining the maximum speed.</p> <p>8.13.5.5 Measure the maximum speed, or the angle at the landing location of the user load depending on the type of trolley ride.</p>	
8.13.6	<p>Ride Clearance Zones (see Fig. A1.66 and Fig. A1.67):</p> <p>8.13.6.1 A clear area, free of equipment, shall surround the trolley path.</p> <p>(1) The clearance zone for upper body type trolley rides shall extend a minimum of 36 in. (914 mm) measured from the centerline of the trolley path throughout the length of travel of the hand gripping component.</p> <p>(2) The clearance zone for seated type trolley rides shall extend a minimum of 48 in. (1219 mm) measured from the centerline of the trolley path. The clearance zone shall extend a horizontal distance of Z + 30 in. (762 mm) from the compressed end stop. When 8.13.5 method for determining speed is 0 ft/s prior to the trolley mechanism contacting the end stop, then the clearance zone shall extend to where the user stops.</p> <p>(3) When 8.13.5 method for determining speed is greater than 0 ft/s at the landing of seated type trolley rides, components such as handholds and barriers shall not extend above the landing platform and access/egress equipment in the trolley ride clearance zone found in 8.13.6.1(2).</p> <p>(4) Platforms and access/egress equipment in the take off and landing area are exempt from the clearance zone requirements</p> <p>8.13.6.2 The center-to-center distance between adjacent designated paths for upper body type trolley rides shall be a minimum of 48 in. (1219 mm).</p> <p>8.13.6.3 The center-to-center distance between adjacent designated paths for seated type trolley rides shall be a minimum of 80 in. (2032 mm).</p> <p>8.13.6.4 Any portion of the suspended elements shall not come within 30 in. (762 mm) of any support structure through its dynamic range of motion when measured in the unloaded condition. Take off and landing areas (excluding support structures) are exempt from this requirement.</p> <p>8.13.6.5 A suspended element shall not come within 60 in. (1524 mm) of an adjacent suspended element through its dynamic range of motion when measured in the unloaded condition.</p>	N/A
8.13.7	<p>Trolley:</p> <p>8.13.7.1 The trolley shall be constructed so that it cannot slip out of place from the cable or track.</p> <p>8.13.7.2 The trolley shall be designed to minimize any fraying or damage to the cable or track, and maintenance shall be addressed by the manufacturer per requirements in 13.1.</p> <p>8.13.7.3 There shall be only one trolley per cable or track.</p> <p>8.13.7.4 When the rolling portion of the trolley is enclosed within a track, the assembly is exempt from crush and shear requirements.</p>	N/A



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8.13.8	<p>Cable</p> <p>8.13.8.1 If cable is used, it shall be designed to withstand six times the calculated load(s) according to the following formula as calculated by a qualified person such as the manufacturer or testing lab</p> $S = \frac{g}{f_{\max}} \left(\frac{Q \times l}{4} + \frac{q \times l^2}{8} \right) \quad (1)$ <p>where:</p> <p>S = calculated load in pounds (lbf) (Newtons (N)),</p> <p>g = acceleration due to gravity, 32 ft/s² (9.81 m/s²),</p> <p>Q = mass of pulley and children [(pulley + 330 lb (150 kg))] (see Note 4),</p> <p>l = total cable length from end to end, ft (m),</p> <p>q = mass of cable, lb/ft (kg/m) (see Note 4), and</p> <p>$f_{\max}$ = sag under load, ft (m).</p> <p>NOTE 4—When pounds mass (lb) is used for Q and q, then $g = 1$ for Eq 1.</p> <p>8.13.8.2 If an adjustment mechanism to control the tension of the cable is provided, it shall meet the requirements of 4.2.2.</p> <p>8.13.8.3 Cables or other non-rigid materials used to create the designated path shall be at least 84 in. (2134 mm) above the underlying protective surfacing at any point when measured in the loaded condition in 8.13.5.1 (see Fig. A1.66).</p>	N/A
8.13.9	Support Structure—The support structure shall be designed to discourage climbing and shall have no designated play surfaces.	N/A
8.13.10	<p>Handgrips:</p> <p>8.13.10.1 Hand gripping components that are an enclosed loop made of flexible material shall not tighten around the user's arm or hand.</p> <p>8.13.10.2 Handgrips shall be blunt edged and shall have a minimum radius of 0.35 in. (9 mm).</p>	N/A
8.13.11	<p>Fall Height:</p> <p>8.13.11.1 The fall height of upper body type trolley rides shall be the distance from the maximum height of the equipment to the protective surface below. Equipment support posts with no designated play surfaces are exempt from this requirement</p> <p>8.13.11.2 The fall height of seated type trolley rides shall be the distance from the top of the sitting or standing surface to the protective surface below plus 64 in. (1626 mm).</p> <p>8.13.11.3 The fall height shall be determined in the unloaded condition.</p>	N/A
8.14	Roofs	Pass
8.14.1	Roofs that are an integral part of a play structure may be any angle, provided that the roof line (lowest edge), excluding support members, is at least 84 in. (2130 mm) above the underlying designated play surface and the pivot point of a swing. (See Fig. A1.58.)	N/A
8.14.2	Roofs that are an integral part of a play structure that are less than 84 in. (2130 mm) above the designated play surface shall contain no designated play surfaces.	N/A
8.14.3	The roof line (lowest edge) shall maintain a clearance of $X + 42$ in. (1065 mm) above the protective surfacing within the use zone of a swing, where X is the distance from the pivot point of the swing to the underlying protective surface. (See Fig. A1.58.)	N/A
8.14.4	Support members shall be designed to discourage climbing and have no designated	Pass



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	play surfaces	
8.14.5	Roofs do not have a fall height requirement.	N/A
8.15	Stepping Forms	N/A
8.15.1	Stepping forms shall contain a minimum designated play surface of 10 in. (250 mm) diameter	N/A
8.15.2	Stepping forms shall have a designated play surface with a slope no greater than 30° from horizontal.	N/A
8.15.3	Stepping forms shall be no greater than 20 in. (508 mm) above the protective surfacing when intended for use by 2 through 5-year-olds and no greater than 30 in. (760 mm) above the protective surfacing when intended for use by 5 through 12-year-olds, unless hand support is provided.	N/A
8.15.4	Stepping form hand supports shall be required at the beginning of the stepping form that is higher than 20 in. (508 mm) when intended for use by 2 through 5-year-olds or 30 in. (760 mm) when intended for use by 5 through 12-year-olds. The hand support height (the vertical distance between the top surface of the stepping form and the top surface of the hand support) shall be between 22 and 38 in. (560 and 970 mm).	N/A
8.15.5	Stepping forms intended for use by 2 through 5-year-olds shall be stationary. Stepping forms greater than 30 in. (760 mm) above the protective surface shall be stationary.	N/A
8.15.6	Stepping forms shall be no greater than 12 in. (300 mm) apart when intended for use by 2 through 5-year-olds and no greater than 18 in. (460 mm) apart when intended for use by 5 through 12-year-olds. This dimension shall be measured edge to edge between the adjacent stepping surfaces. (This measurement will be horizontal when adjacent stepping forms are at the same height and it will be diagonal when adjacent stepping forms are at different heights.)	N/A
8.15.7	The fall height of stepping forms shall be the distance between the highest point of the stepping form and the protective surface below.	N/A
9	Playground Layout	N/C
9.1	Play Structure Use Zone	N/C
9.1.1	There shall be a use zone for each play structure which shall consist of obstacle-free surfacing that conforms to Specification F1292 appropriate for the fall height of the equipment. Field testing of the surface within the use zone shall comply with minimum impact attenuation requirements of Specification F3313. The dimensions and configuration of the use zone shall be dependent upon the type of play equipment, as specified in Section 9. Use zones of certain types of equipment may overlap unless otherwise specified.	N/C
9.2	Stationary Playground Equipment Stationary play equipment may be freestanding structures, may be in combination with other play equipment, or may be part(s) of a composite play structure (see Fig. A1.32).	N/C
9.2.1	The use zone for stationary play equipment shall extend no less than 72 in. (1830 mm) from all sides of the play structure. Equipment that is intended for a user to maintain contact with the ground during play has no individual use zone requirements (for example, free standing talk tubes, free standing activity panels, ground level sandboxes). However, section 9.8.1 placement of play structures and equipment, applies.	N/C
9.2.2	The use zones for two or more stationary play structures that are not physically	N/C



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	attached but are play-functionally linked shall be determined as if the separate equipment were parts of a composite play structure (see Fig. A1.44). 9.2.2.1 The direct distance between stepping surfaces on two functionally linked play structures shall not be greater than 12 in. (300 mm) for 2 to 5-year-olds and 18 in. (460 mm) for 5 through 12-year-olds. This dimension shall be measured edge to edge between the adjacent stepping surfaces.	
9.2.3	The use zone of stationary equipment and other equipment may overlap. If the adjacent designated play surfaces of each structure are no more than 30 in. (760 mm) above the protective surface, the minimum distance between the structures shall be 72 in. (1830 mm). If the adjacent designated play surfaces of either structure are greater than 30 in. (760 mm) above the protective surface, the minimum distance between the structures shall be 108 in. (2740 mm) (see Fig.A1.32).	N/C
9.3	Rotating Play Equipment (see Fig. A1.33):	N/C
9.3.1	The use zone for equipment that rotates around a vertical axis with a maximum dimension less than or equal to 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter shall be no less than 72 in. (1829 mm) from the perimeter of the play structure. Overlapping use zones is permissible if the adjacent fall height of each structure is less than or equal to 30 in. (760 mm) above the protective surface. If the adjacent fall height on either structure exceed a height of 30 in. (760 mm), the minimum distance between structures shall be 108 in. (2740 mm) (see Fig. A1.33).	N/C
9.3.2	The use zone for equipment that rotates about a vertical axis with a maximum dimension greater than 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter and which does not exceed the speed limitation requirements in 8.8.3 shall be no less than 72 in. (1829 mm) from the perimeter of the play structure and shall not overlap any other use zone (see Fig. A1.33). The use zone for equipment possessing any suspended element shall be measured from the outermost point of suspended element through its dynamic range of motion during use.	N/C
9.3.3	The use zone for equipment that rotates about a vertical axis with a maximum dimension greater than 20 in. (508 mm) measured from the axis of rotation to the outmost perimeter and which exceeds the speed limitation requirements in 8.8.3 shall be no less than 108 in. (2743 mm) from the perimeter of the play structure including a 72 in. (1829 mm) use zone that shall not overlap the use zone of other play structures (see Fig. A1.33). The use zone for equipment possessing any suspended element shall be measured from the outermost point of suspended element through its dynamic range of motion during use.	N/C
9.3.4	Single user equipment, such as sand diggers, which require the user to maintain contact with the ground during play, have no individual use zone requirements. However, 9.8.1 applies	N/C
9.3.5	The use zone for equipment that rotates around a horizontal axis and has a designated play surface greater than 30 in. (760 mm) above the protective surface shall be no less than 72 in. (1829 mm) from the perimeter of the play structure. The use zone for equipment that rotates around a horizontal axis and has a fall height of 30 in. (760 mm) or less above the protective surface, such as a log roll, shall be considered stationary play equipment.	N/C
9.3.6	No other play structure use zone shall overlap the use zone of equipment that rotates around a horizontal axis and has a fall height greater than 30 in. (760 mm) above the	N/C



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	protective surface.	
9.4	Swings	N/C
9.4.1	<p>To-Fro Swings</p> <p>9.4.1.1 The use zone to the front and to the rear of to-fro swings shall be a minimum distance of 2X on a line extending 90° both front and rear from the longitudinal direction of the suspending beam, where X equals the vertical distance from the top of the protective surfacing to the pivot point of the swing. The total horizontal distance from the front to the rear of the use zone shall be not less than 4X. (See Fig. A1.34 and Fig. A1.35.)</p> <p>9.4.1.2 For swings with fully enclosed swing seats, the use zone to the front and to the rear of the swing shall be a minimum distance of 2W on a line continuous both front and back 90° from the longitudinal direction of the suspending beam where W equals the vertical distance from the top of the occupant's sitting surface to the pivot point on the swing. The total horizontal distance from the front to the rear of the use zone should not be less than 4W (see Fig. A1.36 and Fig. A1.37).</p> <p>9.4.1.3 No other play structure use zone shall overlap the front-to-rear use zone of a to-fro swing (see Figs. A1.34- A1.37).</p> <p>9.4.1.4 The use zone width for to-fro swings shall be at least as wide as a distance measured from 30 in. (760 mm) on either side of the outer suspending chain or cable measured at 60 in. (1524 mm) above the protective surface (see Figs. A1.34-A1.37).</p> <p>9.4.1.5 The use zone surrounding the support structure of to-fro swings shall extend no less than 72 in. (1830 mm) in all directions from the structure (see Figs. A1.34-A1.37).</p> <p>(1) The support structure use zones for adjacent to-fro swings may overlap (see Figs. A1.34-A1.37).</p> <p>(2) The use zone for a support structure of to-fro swings and the use zone of other play equipment may overlap. The minimum distance between the structures shall be 108 in. (2740 mm).</p>	N/C
9.4.2	<p>Rotating Swings (see Fig. A1.38):</p> <p>9.4.2.1 The use zone for a rotating swing shall be a minimum horizontal distance of Y + 72 in. (1830 mm) in all directions from pivot point of the swing, where Y equals the vertical distance between the pivot point and the top of the swing seat or suspended member.</p> <p>9.4.2.2 No other play structure use zone shall overlap the use zone of a rotating swing.</p> <p>9.4.2.3 The use zone surrounding the support structure of rotating swings shall extend no less than 72 in. (1830 mm) in all directions from the support structure</p> <p>9.4.2.4 The support structure use zones of separate adjacent rotating swings may overlap (see Fig. A1.38), however, swing bay clearance zones (Y + 30 in. (760 mm)) shall not overlap.</p> <p>9.4.2.5 The use zone for a support structure for rotating swings and the use zone of other equipment may overlap. The minimum distance between structures shall be 108 in. (2740 mm).</p>	N/C
9.4.3	<p>Combination Swings</p> <p>The boundary of the use zone for combination swings shall be composed of the individual use zones as defined in 9.4.1 or 9.4.2, or both, for the individual suspended</p>	N/C



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	elements. See Fig. A1.59.	
9.5	Rocking/Springing Play Equipment (see Fig. A1.39):	N/C
9.5.1	Rocking/Springing Play Equipment Intended for Sitting: 9.5.1.1 The use zone for rocking/springing equipment upon which the user is intended to sit shall be no less than 72 in. (1830 mm) in all directions from the at-rest perimeter of the play structure. 9.5.1.2 The use zones of adjacent rocking/springing equipment intended for sitting may overlap when each structure consists of a seat or designated play surface with a height 30 in. (760 mm) or less above the protective use zone surfacing when unoccupied. 9.5.1.3 The use zone for rocking/spring equipment and the use zone of other structures may overlap unless otherwise noted in Section 9. The minimum distance between the outermost edge of the spring/rocking equipment when unoccupied and the outermost edge of the other structure/equipment shall be 72 in. (1830 mm) if both pieces of equipment/structure have designated play surfaces 30 in. (760 mm) or less above the protective surfacing and 108 in. (2740 mm) if either of the pieces of equipment/structure have a designated play surface greater than 30 in. (760 mm) above the protective surface.	N/C
9.5.2	Rocking/Springing Play Equipment Intended for Standing (see Fig. A1.39): 9.5.2.1 The use zone for rocking/springing equipment upon which the user is intended to stand shall be no less than 84 in. (2130 mm) in all directions from the at rest perimeter of the play structure. 9.5.2.2 No other play structure use zone shall overlap the use zone of a rocking/springing structure upon which the user is intended to stand. 9.5.2.3 Equipment with limited movement or equipment on which a user cannot develop enough force to launch or propel themselves away from the equipment are exempt from these requirements.	N/C
9.6	Slides (see Fig. A1.40)	N/C
9.6.1	The use zone around the steps or ladder, platform, and chute or slide bed of straight, wavy, and spiral slides shall conform to the use zone standard for stationary play equipment.	N/C
9.6.2	The use zone at the lower exit end of the chute or slide bed shall be a minimum of X where X equals the vertical distance from the protective surfacing at the lower exit to the highest point of the sliding surface. 9.6.2.1 The use zone at the lower exit end of the chute or slide bed shall extend in the direction of the descent a horizontal distance not less than 72 in. (1830 mm) but need not be greater than 96 in. (2440 mm) from the lower exit.	N/C
9.6.3	Slide Exit Clearance Zone A clear zone, free of equipment, shall extend from the end of the slide to the perimeter of the slide use zone. This area shall have a width as shown in Fig. A1.41, Fig. A1.42, and Fig. A1.43. Slide exit clearance zones for two or more slides may overlap if their sliding paths are parallel as shown in Fig. A1.41 and Fig. A1.42. Merging slides with converging paths of travel shall not have overlapping clearance zones as shown in Fig. A1.43. Exemption: the slide itself may encroach into slide exit clearance zone (for example, spiral slides).	N/C
9.6.4	Embankment Slides:	N/C



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	<p>9.6.4.1 On an embankment slide, the transition area and the slide chute up to the beginning of the exit region has no individual use zone or fall height requirements.</p> <p>9.6.4.2 Platforms that are no greater than 12 in. (305 mm) above the underlying surface that are used to access embankment slides have no individual use zone or fall height requirements.</p> <p>9.6.4.3 The embankment slide shall exit onto a protective surfacing zone that is not part of the embankment.</p> <p>9.6.4.4 The use zone at the lower exit end of the chute shall meet the requirements of 9.6.2 and the slide exit clearance zone of 9.6.3. See Fig. A1.63.</p>	
9.7	Composite Play Structures (see Fig. A1.44):	N/C
9.7.1	The boundary of the use zone for a composite play structure shall be composed of those use zones that have been established for each individual play structure that, when joined together, comprise the composite play structure.	N/C
9.7.2	It is impractical to identify and establish assembled use zone standards for all possible configurations of a composite play structure. Therefore, the professional judgment of play equipment manufacturers, designers, and owner/operators shall be used when designing a modular composite play structure to eliminate hazards created by conflicts in circulation use patterns or close proximity of adjacent components, or both.	N/C
9.8	Placement of Play Structures and Equipment (see Fig. A1.45):	N/C
9.8.1	Sufficient space shall be provided between all adjacent structures and individual play equipment for the purposes of play and circulation.	N/C
9.8.2	In settings where periodic overcrowding is likely, a supplemental circulation area beyond the use zone is recommended. Provision of such a supplemental circulation area shall be contingent upon the professional judgment of the playground designer or owner/operator. See Fig. A1.45, (a) or (b).	N/C
9.8.3	Moving play equipment such as swings and rotating equipment shall be located in a position away from circulation routes and near the periphery of the playground.	N/C
9.8.4	<p>Overhead Obstructions</p> <p>9.8.4.1 Overhead obstructions within the use zones of playground equipment that are not part of the play structure (for example, tree limbs) shall not be within 84 in. (2130 mm) of each designated play surface, the use zone, or above the pivot point of swings, or within $X + 42$ in. (1065 mm) above the protective surface within the use zone of a swing, where X is the distance from the pivot point of the swing to the underlying protective surface. (See Fig. A1.58.)</p> <p>9.8.4.2 All overhead utility line clearances above the use zone areas shall comply with all local, state, and national codes, such as the National Electrical Safety Code</p>	N/C
9.9	Trolley Rides:	N/C
9.9.1	The use zone of trolley rides shall be a minimum of 72 in. (1829 mm) in all directions from the equipment through its dynamic range of motion when measured in the unloaded condition (see Fig. A1.66 and Fig. A1.67).	N/C
9.9.2	The use zone of a suspended seat or handle shall extend beyond the pivot point at the compressed end stop a minimum of 72 in. (1829 mm) + Z, where Z equals the distance between the pivot point and the top of the seat or suspended handle when swung to 45° from horizontal (see Fig. A1.66).	N/C
9.9.3	No other play structure use zone shall overlap the clearance zone of seated type trolley rides in 8.13.6.1(2) (see Fig. A1.66).	N/C



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10.	Accessibility	N/C
10.1	Playgrounds shall comply with the DOJ 2010 Standard for Accessible Design where applicable.	N/C
11	Installation	N/C
11.1	Designer's or Manufacturer's Responsibilities	N/C
11.1.1	The designer or manufacturer of the playground equipment shall provide clear and concise instructions and procedures for the installation of each play structure designed or provided, as well as a complete parts list.	N/C
11.1.2	The designer or manufacturer of the impact attenuating surface shall provide the owner and installer clear and concise instructions and procedures no less detailed than those required by the manufacturer prior to conducting Specification F1292 and/or F3351 laboratory testing and meet the intent of any applicable accessibility standards or laws, such as the DOJ 2010 Standard for Accessible Design. NOTE This information is necessary to install the impact attenuating surface in compliance with this specification, and where applicable, meet the intent of any applicable accessibility standards or laws, such as the DOJ 2010 Standard for Accessible Design.	N/C
11.1.3	Where the designer, manufacturer, or supplier of the playground equipment or impact attenuating surface is also the installer, they shall meet the requirements of 11.3.1.	N/C
11.2	Owner's/Operator's Responsibilities	N/C
11.2.1	The owner/operator or their designated representative shall follow the designer's and manufacturer's instructions and procedures to install all play structures and impact attenuating surfacing in accordance with appropriate standard specification and accessibility where applicable.	N/C
11.2.2	Prior to the playground's first use, the owner/operator shall obtain written verification from a qualified person that the playground equipment and impact attenuating surfacing have been installed in accordance with the requirements of 11.2.1 NOTE The owner/operator should refer to the U.S. CPSC Handbook for guidance in selecting and installing loose-fill impact attenuating surfacing. Compliance of loose-fill surfaces may be verified by a qualified person through laboratory or field testing according to ASTM standard specifications for impact attenuating playground surfacing. NOTE The owner/operator may select on-site field testing to verify specified performance compliance provided those requirements meet or exceed the minimum performance requirements of this specification.	N/C
11.3	Installer's Responsibilities:	N/C
11.3.1	After installation and prior to first use of the playground, the installer of the playground equipment and impact attenuating surfacing shall provide the owner written verification from a qualified person that they have been installed per the designer/manufacturer instructions, plans, and specifications according to the owner's approved plans and purchasing requirements.	N/C
11.3.2	When the owner/operator installs or oversees a community built playground equipment and/or impact attenuating surface installation, they shall follow the written compliance verification procedure as stated in 11.3.1 unless the designer, manufacturer, and/or distributor requires some other form of verification from a qualified person.	N/C
12.	Structural Integrity	Pass



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	After conducting the tests in 12.3.1 – 12.5.2 there shall be no visible crack or breakage of any component and no form of permanent deformation of any component that may adversely affect the structural integrity or safe use of the equipment. After removal of the load, hooks, shackles, rings, or links shall not have opened to more than 0.04 in. (1.0 mm).	
12.1	The structural integrity tests are intended to be conducted by manufacturers on equipment at a test site and are not intended to be performed on equipment installed on the playground or as part of a routine maintenance program. This section is based on the use of performance tests for structural integrity. Performance tests require a definite end point (that can be physically measured) and that the safety factors be included in the loading criteria.	Pass
12.2	Loading Test Criteria:	Pass
12.2.1	The test load shall be applied through appropriate load distribution devices. The load distribution device (loading device) shall be either a loading block(s) or a strap(s) having the dimensions shown in Fig. A1.51.	Pass
12.2.2	After conducting the tests in 12.3.1 – 12.5.2 there shall be no visible crack or breakage of any component and no form of permanent deformation of any component that may adversely affect the structural integrity or safe use of the equipment. After removal of the load, hooks, shackles, rings, or links shall not have opened to more than 0.04 in. (1.0 mm).	Pass
12.3	Strength of Swing Components and Structures:	N/A
12.3.1	Swing assemblies (swing seats, connectors, suspending members, and bearing/hanger assembly) shall be installed in accordance with the manufacturer's installation instructions or supported in an equivalent manner. 12.3.1.1 For swing assemblies intended for single occupancy, a load-distribution device shall be centered on the seat and a vertical downward force of 750 lbf (3336 N) shall be applied. The force shall be applied gradually, attaining but not exceeding 750 lbf and then maintained for 5 min. 12.3.1.2 For swing assemblies intended for multiple occupancy, a load distribution device shall be centered on each sitting position. A vertical downward force of 605 lbf (2691 N) shall be applied to each loading device simultaneously. The force shall be applied gradually, attaining but not exceeding 605 lbf per device and then maintained for 5 min. 12.3.1.3 For swing supporting structures, simultaneously apply at each swing location a vertical downward force of 750 lbf (3336 N) for single-occupancy swings or 605 lbf (2691 N) times the number of intended users for multiple-occupancy swings. Apply the force gradually at locations representing the swing in its "at rest" position. The manufacturer of the multiple-occupancy swing shall specify the number of intended users.	N/A
12.4	Components and Structures Subjected to Vertical Loads:	Pass
12.4.1	12.4.1 For components having designated play surfaces, determine the number of simultaneous users, n, of a component or structure as specified in this section. Individual components of a structure shall be tested as longitudinal components in accordance with 12.4.1.1. In addition, the structure containing those longitudinal components shall be tested in accordance with 12.4.1.2. Other structures are tested in accordance with the appropriate remaining sections of 12.4. If n is not a whole number,	Pass



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	<p>round to the nearest whole number. Place n load distribution devices on the component or structure in a manner that simulates the anticipated load distribution. Simultaneously load each load distribution device with a downward vertical force, F, given by the following equation:</p> $F(lbf) = 250(n + 1)/n$ <p>or</p> $F(N) = 1113(n + 1)/n$ <p>The force shall be applied gradually and then maintained for a period of 5 min.</p> <p>12.4.1.1 Individual Longitudinal Components—(These would include a ladder rung, turning/chinning bars, and so forth.) Measure the length of the component, L, in inches (centimetres) and determine the number of users, n, from the following table. (Round to the nearest whole number.) After the number of users has been determined, apply this number to the equation given in 12.4.1. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain the anticipated load.</p> <table><tr><th colspan="2">Determining Number of Users for Individual Longitudinal Components</th></tr><tr><th>Length of Component</th><th>Estimated Number of Users</th></tr><tr><td>L ≤ 24 in.</td><td>n = 1</td></tr><tr><td>L > 24 in.</td><td>n = L/16</td></tr><tr><td>L ≤ 610 mm</td><td>n = 1</td></tr><tr><td>L > 610 mm</td><td>n = L/410</td></tr></table> <p>12.4.1.2 Structures Containing Two or More Longitudinal Components—(These would include horizontal ladders, vertical ladders, overhead climbers, and upper-body components.) Count the number of longitudinal components, LC, and determine the number of users, n, from the following table. (Round to the nearest whole number.) After the number of users has been determined, apply this number to the equation given in 12.4.1. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain the anticipated load.</p> <table><tr><th colspan="2">Determining Number of Users for Structure Containing Two or More Longitudinal Components</th></tr><tr><th>Number of Longitudinal Components</th><th>Estimated Number of Users</th></tr><tr><td>LC ≤ 5</td><td>n = LC</td></tr><tr><td>LC > 5</td><td>n = (LC + 5)/2</td></tr></table> <p>12.4.1.3 Individual Surfaces—Compute the surface area, A, in square feet (square metres) and determine the number of users, n, from the following table. (Round to the nearest whole number.) After the number of users has been determined, apply the number to the equation given in 12.4.1. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain the anticipated load.</p>	Determining Number of Users for Individual Longitudinal Components		Length of Component	Estimated Number of Users	L ≤ 24 in.	n = 1	L > 24 in.	n = L/16	L ≤ 610 mm	n = 1	L > 610 mm	n = L/410	Determining Number of Users for Structure Containing Two or More Longitudinal Components		Number of Longitudinal Components	Estimated Number of Users	LC ≤ 5	n = LC	LC > 5	n = (LC + 5)/2	
Determining Number of Users for Individual Longitudinal Components																						
Length of Component	Estimated Number of Users																					
L ≤ 24 in.	n = 1																					
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Number of Longitudinal Components	Estimated Number of Users																					
LC ≤ 5	n = LC																					
LC > 5	n = (LC + 5)/2																					



Clause	Test Method & Test Requirement	Rating
	<p>Determining Number of Users for Individual Surfaces</p> <p>Surface Area, ft² Estimated Number of Users</p> <p>$A \leq 1$ $n = 1$</p> <p>$A > 1$ and $A \leq 10$ $n = A$</p> <p>$A > 10$ $n = (A + 10)/2$</p> <p>Surface Area, m² Estimated Number of Users</p> <p>$A \leq 0.09$ $n = 1$</p> <p>$A > 0.09$ and $A \leq 0.93$ $n = 10.8 A$</p> <p>$A > 0.93$ $n = 10.8(A + 0.93)/2$</p> <p>12.4.1.4 Slide Beds—Determine the number of users, n, as follows: $n = L/36$, where L equals the length of the slide bed in inches (see Fig. A1.26, Note 2), or $n = L/910$, where L equals the length of the slide bed in millimetres. (Round to the nearest whole number.) Place n load distribution devices equally spaced on the slide bed. Load each distribution device with a downward vertical force given by the equation in 12.4.1. The force shall be applied gradually and then maintained for a period of 5 min. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain anticipated load.</p> <p>12.4.1.5 Components with Designated Occupancy—The number of users, n, is equal to the number of designated occupants. After the number of users has been determined, apply the number to the equation given in 12.4.1. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain anticipated load.</p> <p>12.4.1.6 2-Dimensional Grid Nets—Determine the number of users, n, as follows:</p> <p>(1) Where the inclination of the net is $\leq 60^\circ$ from horizontal:</p> <p>$n = Apr/5.87$ Where Apr = the area of a horizontal plane projection of the net in ft²</p> <p>$n = Apr/0.55$ Where Apr = the area of a horizontal plane projection of the net in m²</p> <p>(2) Where the inclination of the net is $> 60^\circ$ from horizontal:</p> <p>$n = A/11.75$ Where A = the area in ft²</p> <p>$n = A/1.09$ Where A = the area in m²</p> <p>12.4.1.7 3-Dimensional Matrix Nets—Determine the number of users, n, as follows:</p> <p>(1) Where volume, (V), is defined by the periphery of the net measured in ft³:</p> <p>$V < 150$ $n = V / 22.7$</p> <p>$150 \leq V \leq 450$ $n = 6.6 + [(V - 150)/45.5]$</p> <p>$V > 450$ $n = 13.2 + [(V - 450)/79.7]$</p> <p>(2) Where volume, (V), is defined by the periphery of the net measured in m³:</p> <p>$V < 4.3$ $n = V/0.65$</p> <p>$4.3 \leq V \leq 12.8$ $n = 6.6 + [(V - 4.3)/1.29]$</p> <p>$V > 12.8$ $n = 13.2 + [(V - 12.8)/2.21]$</p> <p>12.4.1.8 Trolley Rides—Determine structural integrity as a swing per 12.3.</p>	
12.5	<p>Components Subjected to Lateral Loads</p> <p>Components subjected to lateral loads such as guardrails, protective barriers, handrails, and so forth should be subjected to two separate load tests. The force shall be applied gradually and then maintained for a period of 5 min.</p>	Pass
12.5.1	<p>Accidental Concentrated Load Test</p>	Pass



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	Place a load distribution device on the component at any point to produce the most adverse effect. Apply a 460-lbf (2046-N) horizontal force to the load distribution device in a direction perpendicular to the length of the component away from the enclosed structure.	
12.5.2	<p>Surge Distributed Load Test</p> <p>Apply a horizontal force, F, in a direction perpendicular to the length of the component and away from the enclosed structure. Apply the force near the top of the component and evenly distribute over the entire length of the component. The test force is given as follows:</p> $F(\text{lbf}) = 150L$ <p>or</p> $F(\text{N}) = 21.9L$ <p>where L = length of the component, ft or cm, respectively.</p>	Pass
12.5.3	Exemptions to 12.5—Components intended for users standing at grade, such as sandboxes, play panels, sand diggers, etc.	N/A
12.6	Alternatives to Testing for Structural Integrity:	N/A
12.6.1	Instead of the tests in 12.3.1 – 12.5.2, it is acceptable that a licensed architect or a licensed professional engineer certify the integrity of the equipment if it were to be subjected to the aforementioned test loads (see 12.3.1 – 12.5.2).	N/A
13	Maintenance	N/C
13.1	Public Use Playground Equipment	N/C
	The designer or manufacturer of each play structure shall provide to the owner/operator clear and concise inspection, maintenance, and repair instructions, including, but not limited to, what, when, and how to inspect, maintain, and repair.	
13.1.1	The owner/operator shall maintain and repair each play structure within the playground in accordance with designer/manufacturer's installation and maintenance instructions and in compliance with Specification F1487, and where applicable, addresses the intent of the DOJ 2010 Standard for Accessible Design.	N/C
13.1.2	The owner/operator shall make periodic inspections of each play structure and remove extraneous materials that could cause injury, infection, or disease.	N/C
13.2	Impact Attenuating Surfacing	N/C
13.2.1	The owner/operator shall maintain and repair the impact attenuating surfacing within the use zone of each play structure in accordance with designer/manufacturer's installation and maintenance instructions and in compliance with Specifications F1487 and F1292 appropriate for the fall height of each play structure and, where applicable, maintains the surfacing to address the intent of the DOJ 2010 Standard for Accessible Design.	N/C
13.2.2	The owner/operator shall make periodic inspections of the impact attenuating surfacing within the use zone of each play structure and remove extraneous materials that could cause injury, infection, or disease.	N/C
13.3	Records—The owner/operator shall establish and maintain detailed installation, assembly, inspection, maintenance, and repair records for each public-use playground equipment area.	N/C
	NOTE 9—Section 11 of this specification details who is responsible for providing most	



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	of the information necessary to fulfill the above documentation requirement.	
14.	Signs or Labels, or Both	N/C
14.1	Posting of signs and/or labels shall be the responsibility of the owner/operator of the play equipment. The information regarding the intended ages of users shall be provided by the manufacturer, designer, or consultant.	N/C
14.1.1	Signs or labels, or both, shall be placed so they: 14.1.1.1 Are readily visible to the intended viewer, and 14.1.1.2 Alert the viewer to the potential hazard in time to take appropriate action.	N/C
14.1.2	Signs or labels, or both, shall be placed on the equipment or be freestanding.	N/C
14.1.3	Freestanding signs or labels, or both, when used, shall be located outside of the equipment use zone and meet the requirements of 9.1.	N/C
14.2	Information communicated on the sign or label, or both, shall address but not be limited to the following messages:	N/C
14.2.1	Information message communicating age appropriateness.	N/C
14.2.2	Information message communicating supervision recommendation.	N/C
14.2.3	Warning message communicating the removal of helmets, drawstrings or accessories around the neck.	N/C
14.2.4	Warning message communicating hot play surfaces and/or surfacing, when applicable.	N/C
14.2.5	Warning message communicating the hazard of play equipment located over hard surfaces, when applicable.	N/C
14.3	Specifications for Signs or Labels, or Both:	N/C
14.3.1	Specification for all warning signs or labels, or both, should conform to ANSI Z535.1 and either ANSI Z535.2 or ANSI Z535.4 in the following areas: legibility, type of lettering, clarity of message and symbol, color specifications, and word message and visibility.	N/C
14.3.2	Durability for the Labels or Signs The labels or signs should conform to UL 969.	N/C
14.3.3	It is the responsibility of the owner/operator to replace signs or labels, or both, should they become illegible, destroyed, or removed.	N/C
15.	Manufacturer Identification	N/C
15.1	All play structures and composite play structures shall be required to have the manufacturer's identification.	N/C
15.2	The manufacturer's identification shall appear, shall be durable, and shall be placed on the play structure, if it stands alone, or on a composite play structure. Custom and community-built equipment shall also carry the identification of the designer.	N/C
16	Keywords	N/C
16.1	consumer safety; playground equipment; public use	N/C
Annex(Mandatory Information)		
A1. FIGURES		
Appendix (Nonmandatory Information)		
X1. HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA) INTRODUCTION		



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ASTM F1918-21: Standard Safety Performance Specification for Soft Contained Play Equipment

Scope:

1. This safety performance specification provides safety and performance standards for soft contained play equipment. Its purpose is to reduce the potential for life-threatening and debilitating injuries.
2. The range of users encompassed by this safety performance specification is the 5th percentile 2 year old to the 95th percentile 12 year old
3. Public playground equipment, home playground equipment, sports equipment, amusement rides, fitness equipment not part of the play system, water-related attractions and devices, and toys and juvenile products are not included in this specification.
4. This specification does not address accessibility, except as it pertains to safety issues not covered in The Americans With Disabilities Act Accessibility Guidelines (ADAAG).
5. Clause 1.5-1.6 details see ASTM F 1918-21

Maximum user weight: / Total number of users: 11 children
Age range: 3-12 Number of tested samples: 1 pc

Clause	Test Method & Test Requirement	Rating
4	General Requirements	
4.1	Playground equipment represented as complying with this consumer safety performance specification shall meet all applicable requirements specified herein. Anyone representing compliance with this specification shall keep such essential records as are necessary to document any claim that the requirements within this specification have been met.	N/C
4.2	SCPE should be designed to allow natural air circulation and lines of visibility between users and persons supervising.	Pass
5	Materials and Manufacture	
5.1	General Requirements—Soft contained play equipment shall be manufactured and constructed only of materials that have a demonstrated durability in the playground or similar setting. Any new materials shall be documented or tested for durability by the soft contained play equipment manufacturer.	N/C
5.1.1	Regardless of the material or the treatment process used, the manufacturer shall not utilize materials known to be hazardous (for example, lead, arsenic, creosote). All paints or similar finishes shall comply with 16 CFR Part 1303.	N/C
5.2	All fasteners used to construct soft contained play equipment shall be manufactured in accordance with Guide F1077 and shall meet the requirements of Section 6.	N/C
5.2.1	All fasteners, connecting, and covering devices shall be inherently corrosion resistant or be provided with a corrosion resistant coating.	N/C
5.2.2	When installed in accordance with the manufacturer's instructions, fasteners, connecting, and covering devices shall not loosen or be removable without the use of tools. Lock washers, self-locking nuts, or other locking means shall be provided for all fasteners to secure them from unintentional loosening. Hardware in moving joints shall also be secured against unintentional loosening.	N/C
5.2.3	Connecting devices and hooks shall be subject to the requirements of Section 6.	N/C
6.	Performance Requirements	
6.1	These requirements apply to the play equipment and do not apply to nonuse zones	
6.2	Head and Neck Entrapment	



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Clause	Test Method & Test Requirement	Rating
6.2.1	<p>Accessible Openings A completely bounded rigid opening is accessible when it is possible to insert the torso test probe (see Fig. A1.1) into the opening to a depth of 4.0 in. (100 mm) or more.</p> <p>6.2.1.1 Test Procedure for Completely Bounded Rigid Openings—Align the torso probe (see Fig. A1.1) so that the plane of its base is parallel to the plane of the opening. Rotate the probe to its most adverse orientation (that is, major axis of the base of the probe parallel to the major axis of the opening) and attempt to insert it in the opening. If it is possible to insert the torso probe into the opening to a depth of 4.0 in. (100 mm) or more, place the head probe (see Fig. A1.2) in the opening with the plane of the base of the probe parallel to the plane of the opening. An opening passes this test if (1) the opening does not admit the torso probe when it is rotated to any orientation about its own axis, or (2) the opening admits the torso probe and also admits the head probe. An opening fails the test if the opening admits the torso probe but does not admit the head probe.</p>	Pass
6.2.2	<p>Nonrigid Completely Bounded Opening A nonrigid opening such as may be found in but not limited to flexible nets, tarps, and plastic enclosures is considered accessible if a torso probe will penetrate the opening to a depth of 4.0 in. (100 mm) or more when tested in accordance with the test procedure outlined in 6.2.2.1 Test Procedure for Completely Bounded Non-rigid Openings—Align the torso probe (see Fig. A1.1) in the opening, Rotate the probe to its most adverse orientation (that is, major axis of the base of the probe parallel to the major access of the opening). Apply a force of 50 lbf (222 N) to the probe to attempt to pass it through the opening. If the base of the probe passes through the opening, place the large head probe in the opening, tapered end first, with the plane of its base parallel to the plane of the opening. Apply a force of 50 lbf (222 N) to the probe to attempt to pass it through the opening. A non-rigid opening passes the test if: (1) the opening does not allow the torso probe to be inserted so deep that the opening admits the base of the probe when it is rotated to any orientation about its own axis, or (2) the opening allows full passage of the torso probe and also allows the large head probe to pass completely through. A non-rigid opening fails the test if the opening allows full passage of the torso probe but does not admit the large head probe.</p>	Pass
6.2.3	<p>Angular Portions of Openings—Angles formed by the surfaces of an opening (that is, adjacent surfaces or surfaces that intersect when projected with a distance between surfaces greater than 9.0 in. (230 mm)) should be at least 55° unless one of the conditions defined in 6.2.3.1 exists.</p> <p>6.2.3.1 Exemptions to 6.2.3: (1) Inverted Angle of V Condition—Those V's which are inverted. A V is considered inverted if the lower adjacent leg forming the V is horizontal or slopes downward from the apex (see Fig. A1.3). (2) Filled Apex Condition—V angles less than 55° where the apex of the angle is filled to the point that will not allow the head probe (see Fig. A1.3) to contact both surfaces of the angle simultaneously when the probe is rotated to any orientation about its own axis (see Fig. A1.3).</p>	Pass
6.3	Sharp Points and Edges—There shall be no accessible sharp points or edges, on soft contained play equipment.	Pass See Below
6.3.1	Sharp Points and Sharp Edges—All points and edges on soft contained play equipment shall be tested for sharpness in accordance with the federal technical requirements in 16 CFR 1500 referenced in 2.2.	Pass



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6.3.2	The exposed open ends of all tubing not resting on the ground, or otherwise covered, shall be provided with caps or plugs that cannot be removed without the use of tools.	Pass
6.3.3	Suspended members, such as rings on upper body equipment and swing seats, shall have a minimum radius of 0.25 in. (6 mm) on corners and edges. This requirement does not apply to swing belt seats, straps, ropes, chains, connectors, and other flexible components.	N/A
6.3.4	A cut-off bolt end projecting beyond the face of the nut shall be free of burrs, sharp points, and sharp edges.	Pass
6.4	Protrusions—There shall be no protrusions on the accessible portions of soft contained play equipment. Four protrusion test gauges (shown in Fig. A1.4 and Fig. A1.5) are required to determine whether projections are protrusions. Their use is described in this section.	Pass
6.4.1	Accessible Projections—A projection is not accessible and is not a protrusion when it is recessed or located in such a manner that does not allow any of the protrusion gauges to be placed over it. Any of the conditions described in the remainder of this section constitutes a protrusion hazard.	Pass
6.4.2	Determining Whether a Projection is a Protrusion—Successively place each of three gauges (see Fig. A1.4) over each accessible projection (see Figs. A1.6 and A1.7). Determine whether the projection extends beyond the face of any gauge. The projection fails the test and is a protrusion if it extends beyond the face of any of the three gauges	Pass
6.4.3	Suspended Member Protrusions—Test for this condition with the suspended member in all positions of its intended travel. Place the suspended member protrusion gauge (see Fig. A1.5), oriented vertically, over any projection accessible at any point throughout the path of travel. Any projection on the front or rear surface of suspended members of swing assemblies which extends beyond the face of the test gauge (see Fig. A1.5) is a protrusion.	Pass
6.5	Entanglement—There shall be no accessible entanglement hazards on soft contained play equipment. Three test gauges, a feeler gauge, and the means to accurately measure a 0.12 in. (3 mm) extension are required to determine whether entanglement hazards exist. Any of the conditions described in this section constitutes an entanglement hazard.	Pass
6.5.1	Slides—Slides, especially in their entrance areas, together with their means of attachment, pose a greater risk of entanglement than other play components. Therefore, the following requirements apply to slides in the areas shown in Fig. A1.8. 6.5.1.1 A projection that meets both of the following conditions is an entanglement hazard: (1) The projection allows one of the three protrusion gauges (see Fig. A1.4) to pass over it and contact the initial surface, and (2) the projection extends perpendicular (65°) from the initial surface more than 0.12 in. (3 mm). 6.5.1.2 Slides shall be constructed in such a manner as to provide a smooth continuous sliding surface (roller slides exempted), with no gaps or spaces that might create an entanglement hazard such as but not limited to the space created between sidewalls when two single slides are combined to create a doublewide slide or the point where a hood attaches to the sidewalls of a slide.	Pass
6.5.2	Projections from a Horizontal Plane A projection that meets all of the following three conditions is an entanglement hazard. 6.5.2.1 The projection fits within any of the three protrusion gauges (see Fig. A1.4). 6.5.2.2 It projects upwards from a horizontal plane (see Fig. A1.9 (1) through (6) and Fig. A1.10).	Pass



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	6.5.2.3 The projection extends greater than 0.12 in. (3 mm) perpendicular ($\pm 5^\circ$) to the plane of the initial surface (see Fig. A1.9 (1) through (6) and Fig. A1.10).	
6.5.3	Exposed Bolt End Projections Any accessible bolt end projecting beyond the face of the nut more than two full threads is an entanglement hazard. A bolt end is inaccessible and not an entanglement hazard when it is not possible for any of the three protrusion gauges (see Fig. A1.4) to pass over it or if the bolt end is recessed and the 3.5 in. (89 mm) OD protrusion gauge (see Fig. A1.4) cannot be made to contact the bolt end when the outside curve of the gauge is placed flat against the recessed area (see Fig. A1.11).	Pass
6.5.4	Projections That Increase in Size Any projection that fits within any of the three protrusion test gauges (see Fig. A1.4) and increases in size or diameter from the initial surface to the outer end (see Fig. A1.9 (7)) is an entanglement hazard.	Pass
6.5.5	Connecting Devices Connecting devices such as but not limited to, S-hooks, pelican hooks, and C-hooks, when properly closed, are not entanglement hazards. These connectors are considered closed when there is no gap or space greater than 0.04 in. (1 mm) when measured with a feeler gauge (see Fig. A1.12 (1)). 6.5.5.1 S-hook connectors are subject to the additional requirements in 1 through 3 below, since failure to meet any of the corresponding requirements will result in an entanglement hazard. (1) No portion of the closed end of an S-hook lower loop shall project beyond the vertical boundary established by the upper loop (see Fig. A1.12 (2)). (2) An S-hook upper loop that completely overlaps the connector body shall not extend past the connector body (see Fig. A1.12 (3)). An S-hook upper loop shall also be permitted to align with or partially overlap with the connector body. (3) An S-hook lower loop shall align with the connector body and not overlap it in any way (see Fig. A1.12 (4)).	N/A
6.5.6	Windows in slides must be completely covered with a transparent material. Windows and their means of attachment must meet the requirements of 6.4.	Pass
6.6	Crush and Shear Points There shall be no crush, or shear points caused by junctures of two components moving relative to one another, or at an opening present at the junction of a stationary support and a rigid supporting member for a swinging element (for example, pendulum see saw and glide rides) while the swinging elements are within their normal swinging angles. A crush or shear point is any point that entraps at one or more positions at 0.625 in. (16 mm) diameter rod. Exemptions to 6.6: (1) Chain and its method of attachment, and (2) The attachment of heavy duty coil springs to the body and base of rocking equipment. (3) The area between small lightweight moving parts necessary as an integral part of the play activity (for example, abacus beads, bell clappers, telephone receivers) provided that this area is not considered a crush or shear point.	Pass
6.6.1	To reduce the likelihood of unintentional contact with a crush or shear point, an opening shall comply with either 6.6.1.1 or 6.6.1.2. 6.6.1.1 An opening with a minor dimension of less than 1 in. (25 mm) is acceptable if a finger probe (as illustrated in Fig. A1.13), when inserted point first into an opening, cannot be made	Pass



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Clause	Test Method & Test Requirement	Rating														
	<p>to touch any crush or shear point. The probe shall be applied in all possible articulated positions with an applicable force not to exceed 1 lbf (4 N).</p> <p>6.6.1.2 An opening in an enclosure with a minor dimension of 1 in. (25 mm) or more, shall require that the crush or shear point be located at a distance as specified in Table 1 from the plane of the opening.</p> <p>NOTE 1—An enclosure in this case covers a crush or shear point.</p> <p>TABLE 1 Minimum Acceptable Distance from an Opening to a Crush or Shear Point</p> <table><tr><th>Minimum Dimension of Opening,^A in. (mm)^B</th><th>Minimum Distance from Opening to Part, in. (mm)</th></tr><tr><td>1.0 (25)</td><td>6.5 (165)</td></tr><tr><td>1.25 (32)</td><td>7.5 (190)</td></tr><tr><td>1.5 (38)</td><td>12.5 (320)</td></tr><tr><td>1.875 (48)</td><td>15.5 (395)</td></tr><tr><td>2.125 (54)</td><td>17.5 (445)</td></tr><tr><td>More than 2.125 (54) and less than 6.0 (150)</td><td>30.0 (760)</td></tr></table> <p>^A See 6.6.1.2.</p> <p>^B Between 1 and 2.5 in. (25 and 64 mm) interpolation is used to determine values specified in the table.</p> <p>6.6.1.3 Exemptions to 6.6:</p> <p>(1) Chain and its method of attachment, and</p> <p>(2) The attachment of heavy duty coil springs to the body and base of rocking equipment.</p> <p>(3) The area between small lightweight moving parts necessary as an integral part of the play activity (for example, abacus beads, bell clappers, telephone receivers) provided that this area is not considered a crush or shear point.</p>	Minimum Dimension of Opening, ^A in. (mm) ^B	Minimum Distance from Opening to Part, in. (mm)	1.0 (25)	6.5 (165)	1.25 (32)	7.5 (190)	1.5 (38)	12.5 (320)	1.875 (48)	15.5 (395)	2.125 (54)	17.5 (445)	More than 2.125 (54) and less than 6.0 (150)	30.0 (760)	
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6.7	Rope, cable, or chain shall be fixed at both ends and not be capable of being looped back on itself, creating an inside loop perimeter greater than 5 in.	N/A														
7.	Requirements for Access/Egress															
7.1	Rung Ladders, Stepladders, Stairways, and Ramps (Does Not Address Wheelchair Use):	Pass														
7.1.1	Steps and rungs shall be evenly spaced within a tolerance of ±0.25 in. (± 6.4 mm) and horizontal within a tolerance of ±2°.	Pass														
7.1.2	Steps and rungs shall not trap water (that is, no standing water) and should not encourage the accumulation of debris.	Pass														
7.1.3	See Table 2 for access slope, tread, rung, or ramp width, tread depth, ladder rung diameter, and vertical rise.	Pass														



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7.1.4	<p>Handrails:</p> <p>7.1.4.1 Continuous handrails or alternative means of hand support shall be provided on both sides of stairways (see 7.2.1.3 for spiral stairways) and stepladders that have more than one tread.</p> <p>7.1.4.2 Stairways or stepladders which consist of only one tread shall have handrails or alternative means of hand support on both sides.</p> <p>7.1.4.3 Handrails or other means of hand support shall be available for use at the beginning of the first step.</p> <p>7.1.4.4 Handrails shall be between 0.95 and 1.55 in. (24 and 39 mm) in diameter or maximum cross section.</p> <p>7.1.4.5 Handrails or alternative means of hand support height (the vertical distance between the top front edge of a step or, if used on a ramp, the top of the ramp surface, and the top surface of the handrail above it) shall be between 22 and 38 in. (560 and 970 mm).</p>	Pass																																																																																																																											
7.2	Other Means of Access:	N/A																																																																																																																											
7.2.1	<p>Spiral Stairways:</p> <p>7.2.1.1 Spiral stairways shall meet the general requirements for spacing, orientation, drainage, tread width, and vertical rise specified for stairway access in 7.1.1 through 7.1.3.</p> <p>7.2.1.2 The depth of the outer edge of the tread on spiral stairways shall be 7.0 in. (178 mm) or greater on equipment for children 2 through 5 years, and 8.0 in. (203 mm) or greater on equipment for children 5 through 12 years. These depth requirements apply to spiral stairways with both open or closed risers.</p> <p>7.2.1.3 Spiral stairways shall meet the requirements specified for handrails in 7.1.4. However, when the design of the stairway does not permit handrails on both sides of the</p>	N/A																																																																																																																											



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	stairway, a continuous handrail or alternative means of hand support shall be provided along the outside perimeter of the steps.	
7.2.2	Flexible Components 7.2.2.1 Flexible components used as access to other components of equipment shall be securely connected at both ends. When one end is connected to the ground, the anchoring devices shall be beneath the base of the minimum required depth of the protective surfacing material. 7.2.2.2 Connections between flexible components used as access to other components of equipment shall be securely fixed. 7.2.2.3 Flexible components used as access to other components of equipment for use by 2 through 5 year olds shall readily allow users to bring both feet to the same level before ascending to the next level.	N/A
7.3	Transition from Access to Platform	Pass
7.3.1	On stairways and stepladders, there shall be a continuation of handrails from the access to the platform.	Pass
7.3.2	On accesses that do not have side handrails or alternative means of hand support such as rung ladders or flexible components, there shall be alternative hand-gripping support to facilitate the transition to the platform.	Pass
7.3.3	For rung ladders, flexible components, and arch climbers, the stepping surface used for final access shall not be above the designated play surface it serves.	Pass
7.4	Platforms, Landings, Walkways, Ramps, and Similar Transitional Play Surfaces:	Pass
7.4.1	Platform surfaces shall be horizontal within a tolerance of $\pm 2^{\circ}$	Pass
7.4.2	Platforms, landings, walkways, ramps, and similar transitional play surfaces shall not trap water and should not encourage accumulation of debris.	Pass
7.5	Access/Egress Accessibility:	N/A
7.5.1	When an accessible entrance for disabled users is provided, a means of egress shall also be provided	N/A
7.5.2	All accessible entries shall provide wheelchair parking spaces meeting the requirements of ADAAG.	N/A
7.5.3	All wheelchair parking spaces should be clear of obstructions, and not overlap other access and egress use zones.	N/A
8	Equipment	
8.1	General Equipment Requirements:	Pass
8.1.1	For parts of the SCPE which serve as a barrier between accessible and non-accessible areas of the SCPE, the vertical distance between the lowest part of the SCPE and the surface beneath (that is, the ground, floor and resilient surfacing) shall not exceed 4.0 in.	Pass
8.1.2	Users shall not be able to exit from the contained equipment except at designated access and egress points. All accessible openings in the contained play equipment other than specified access/egress points shall not admit the torso probe as specified in the test procedure for completely bounded rigid openings (6.2.1.1) and as specified in the test procedure for completely bounded nonrigid openings (6.2.2.1).	Pass
8.1.3	Differences in height between two consecutive designated play surfaces shall not exceed 24 in. (610 mm) unless the lower designated play surface is made to conform to Specification F1292 for impact attenuation.	Pass
8.1.4	Differences in height between two consecutive designated play surfaces shall not exceed 24	Pass



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	in. (610 mm) in locations where it is possible to enter the lower designated play surface from a passage blind to a user on the upper designated play surface.	
8.1.5	Any flexible material or device in a soft contained play system that is able to be stretched by a force of 50 lbf (220 N) applied with the torso probe (as identified in Section 6) shall not contact any hard object. Flexible portions of the soft contained play equipment shall not be placed adjacent to potential impact hazards such as glass windows or furniture.	N/A
8.1.6	<p>External Parts of SCPE:</p> <p>8.1.6.1 Accessible External Containment Walls:</p> <p>(1) Accessible external containment walls of the SCPE will have a minimum height of 84 in., when measured from the surface directly adjacent to the base of the SCPE. (See Fig. A1.14.) If the height of the ceiling precludes this, the containment wall of the SCPE shall extend to a height such that the top of the external portion of the SCPE is 3.0 in. or less from the ceiling. If there is an elevated surface which has the potential to allow standing, walking, crawling, sitting, or climbing, or a flat surface larger than 2 in. wide by 2 in. long having less than a 30° angle from horizontal (for example, slide exit, window ledge) that is located at a distance of 28 in. or less from the containment wall of the SCPE, and at a height of 84 in. or less above ground level, the minimum height of the containment wall shall be 84 in. above the highest portion of this elevated surface and 84 in. above a horizontal line extending 36 in. from each edge of highest portion of the referenced elevated surface (see Fig. A1.14). If the height of the ceiling precludes this, the containment wall of the SCPE shall extend to a height such that the top of the external portion of the SCPE is 3.0 in. or less from the ceiling.</p> <p>(2) There shall be no openings in the containment wall 84 in. or less above the bottom of the containment wall that admit the 0.50-in. diameter test probe (see Fig. A1.15) to a depth greater than 0.75 in.</p> <p>(3) There shall be no projections from the containment wall 84 in. or less above the bottom of the containment wall and greater than 0.50 in. in width (as measured along the top of the projection) or diameter that extend more than 0.75 in. from the containment wall.</p> <p>NOTE 2—Any projections from the containment wall must also meet the requirements of 6.4 on protrusions and 6.5 on entanglement</p> <p>(4) Openings between a gate (for example, to utility areas) and the enclosure which surrounds the gate in external containment walls are exempt from 8.1.6.1(2) with the following conditions: (a) the bottom of the opening at the base of the gate is 6 in. or less above the ground or floor, and (b) there are no openings directly above hinges, latches, or other horizontal surfaces that admit 0.50-in. diameter test probe to a depth greater than 0.75 in.</p> <p>(5) Activity panels that are part of or affixed to external containment walls and which are extended for a user to maintain ground contact during play are exempt from 8.1.6.1(2) and 8.1.6.1(3) if there are no openings in or projections from the containment wall 48 in. or less above the top of the activity panel.</p> <p>8.1.6.2 Overhead Framework:</p> <p>(1) Overhead horizontal pipes that are within 96 in. of the underlying surfaces and having diameters of less than 5 in. shall have no more than 270° of the pipe exposed; or shall have a vertical barrier panel that extends from the top of the horizontal pipe to a minimum height of 96 in. above the underlying surface.</p> <p>(2) I-beam support structures within 96 in. of the underlying surface shall have no designated play surfaces and no openings that would allow a user to grasp a section of the beam for</p>	N/A



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	support.	
8.1.7	<p>Pipe Covering:</p> <p>8.1.7.1 Vertical Pipe Covering:</p> <p>(1) When fabric mesh is used as a means of containment, padded or pliable covering shall be used on all exposed vertical pipes at entrance and exit areas and in all accessible areas where 270° or more of the pipe is exposed. (See Fig. A1.16.)</p> <p>(2) If other materials (for example, metal or plastic mesh, solid panels) are used as a means of containment, vertical pipe is not required to be covered.</p> <p>8.1.7.2 Horizontal Pipe Covering:</p> <p>(1) All accessible horizontal pipe located within 60 in. of any designated play surface and having 270° or more of the pipe accessible shall have a padded or pliable cover. (See Fig. A1.17.)</p> <p>(2) Within any entrance/exit, slide run out, or step up/down area, any accessible overhead horizontal pipe located within 60 in. of the edge of a designated play surface (for example, leading edge of a platform, change of elevation or the end of a slide exit) and having 180° or more of the pipe accessible shall have a padded or pliable cover. (See Fig. A1.18.)</p> <p>NOTE 2—The area directly above the enclosed portion of a slide exit does not require padding</p>	Pass
8.2	Climbers and Upper Body Equipment:	Pass
8.2.1	Hard rungs that are used for hand grip shall be between 0.95 in. and 1.55 in. (24 mm and 39 mm) in diameter.	N/A
8.2.2	Padded rungs that are used for hand grip shall be between 0.95 in. and 1.55 in. (24 mm and 39 mm) in diameter when fully compressed.	Pass
8.2.3	Padded rungs that are used for hand grip shall be no larger than 1.55 in. (39 mm) in diameter when not compressed.	Pass
8.2.4	All rungs used for hand grip, and any padding used on them, shall not spin, rotate, or roll while in use.	Pass
8.2.5	The center to center distance between rungs on upper body equipment with fixed handholds shall be no greater than 15 in. (380 mm).	Pass
8.2.6	The horizontal distance from the leading edge of the takeoff or landing structure or both, out to the center line of the first handhold of upper body equipment shall be no greater than 10 in. (250 mm). In addition, where the takeoff or landing point is provided by means of rungs, the horizontal distance to the first handhold shall be at least 8 in. but no greater than 10 in.	Pass
8.2.7	All handgrip devices on upper body equipment shall be between 0.95 in. (24 mm) and 1.55 in. (39 mm) in diameter.	N/A
8.2.8	Climbers or chutes used as access shall provide a means of hand support for use while climbing.	Pass
8.3	Sliding Poles:	N/A
8.3.1	Sliding poles are not recommended in SCPE.	N/A
8.4	Balance Beams:	N/A
8.4.1	The top surface of balance beams shall be no greater than 12 in. (300 mm) above the underlying surface.	N/A
8.4.2	Support structures for balance beams shall not pose a tripping hazard.	N/A
8.5	Slides:	Pass
8.5.1	At the entrance to open bedway slides there shall be a means to channel the user into a	Pass



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	sitting position (for example, a hood or tube).	
8.5.2	Any change in the slope of a slide shall not allow a user to lose contact with the sliding surface.	Pass
8.5.3	For Straight Slides Only The height to length ratio of the sliding surface shall not exceed 0.577 (30°) as measured in Fig. A1.19.	N/A
8.5.4	No span of the sliding surface shall have a slope that exceeds 50°.	Pass
8.5.5	The slide chute inside width shall be 12 in. (300 mm) or greater for 2 through 5-year-olds, or 16 in. (410 mm) or greater for 5 through 12-year-olds.	Pass
8.5.6	Slides with flat, open chutes shall have sidewalls with a height 4 in. (100 mm) or greater, that extend along both sides of the chute for the entire length of the sliding surface.	Pass
8.5.7	Straight slides shall be permitted to have a chute with a circular, semicircular, or curved cross section, provided that the heights of both sides are 4 in. (100 mm) (y) when measured at right angles above a horizontal line (x) that is 12 in. (300 mm) long when intended for 2 through 5-year-olds or 16 in. (400 mm) long when intended for 5 through 12 year-olds (see Fig. A1.20).	N/A
8.5.8	All slides with a curved path of travel shall minimize the likelihood of lateral discharge (for example, spiral slides and other slides that change in horizontal direction; slides with a wide, shallow chute; and so forth).	Pass
8.5.9	The internal diameter of tube slides shall be 23 in. (580 mm) or greater.	Pass
8.5.10	Roller Slides 8.5.10.1 There shall be no crush, shear, entrapment, entanglement, or catch points between the junctures caused by two or more components of a roller slide. 8.5.10.2 A crush, shear, entrapment, entanglement, or catch point is any point that will admit a 0.19 in. (5 mm) diameter neoprene test rod at one or more positions, either between rollers or adjacent stationary segments. 8.5.10.3 The neoprene test rod shall have a hardness reading between 50 and 60 as determined by a Type A durometer in accordance with Test Method D2240.	N/A
8.5.11	Slide Exit Regions 8.5.11.1 For slides with an elevation of no greater than 48 in. (1.2 m), the height of the slide exit region shall be no greater than 11 in. (280 mm) above the protective surfacing. For slides with an elevation greater than 48 in. (1.2 m), the height of the slide exit region shall be between 7 and 15 in. (180 and 380 mm) above the protective surfacing (see Fig. A1.21). 8.5.11.2 The slope of the slide exit region shall be between 0 and -4° as measured from a horizontal plane (see Fig. A1.22). 8.5.11.3 Slides shall have a slide exit region length of 11 in. (280 mm) or greater (see Fig. A1.22). 8.5.11.4 The radius of curvature of the sliding surface in the exit region shall be 30 in. (760 mm) or greater (see Fig. A1.22). 8.5.11.5 Slide exit region edges shall be rounded or curved	Pass
8.5.12	Slide use zones shall meet the requirements of 9.3.	Pass
8.6	Air Filled Devices:	N/A
8.6.1	Air filled devices shall meet the structural integrity criteria as specified in Section 10, without the designated play surface of the device contacting a hard substrate or floor when fully loaded.	N/A
8.6.2	Air filled devices upon which users are intended to walk or crawl shall be secured to minimize lateral movement during use.	N/A



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8.6.3	Blowers and electrical cords shall be kept out of reach of the public located in a non-use zone.	N/A
8.6.4	Electrical cords shall not pass under the air filled device and shall not interfere with its operation.	N/A
8.6.5	The air filled device shall be fully inflated before users are allowed inside during use.	N/A
8.7	Upholstery	N/A
8.7.1	Hardware, staples, or fastening devices used in the construction of padding or upholstered constructions (assemblages of fabrics, foams, and substrates) or both, shall not have hidden sharp points or hazards when the surface of the pad or upholstered construction is fully compressed by a user.	N/A
8.8	Ball Pools:	N/A
8.8.1	There shall be no designated play surfaces in ball pools other than the floor of the ball pool itself, except at designated access/egress points.	N/A
8.9	Log Rolls:	N/A
8.9.1	Log rolls are not recommended for children under 5 years of age.	N/A
8.9.2	The highest point of the top surface of the roller shall be no greater than 18 in. (460 mm) above the underlying surface.	N/A
8.9.3	Rigid hand-gripping component(s) shall be provided, and shall aid in mounting and dismounting the roll, and maintaining balance while in use. The handgripping component(s) shall meet the same dimensional requirements as stated for rungs in 8.2.1-8.2.4.	N/A
8.10	Track Rides	N/A
8.10.1	Track rides are not recommended for children under 5 years of age.	N/A
8.10.2	The lowest portion of the hand-gripping component shall be a minimum of 64 in. (1630 mm) above the surfacing. The maximum height of the hand-gripping components shall not exceed 78 in. (1980 mm). The hand-gripping component shall comply with Sections 8.2.1 through 8.2.4.	N/A
8.10.3	The vertical distance between the overhead hand gripping component and the surface shall be uniform throughout the length of the ride.	N/A
8.10.4	Track rides should be designed to prevent the structural elements from obstructing the user in the landing area.	N/A
8.10.5	An unobstructed clearance zone shall be maintained throughout the length of travel of the hand-gripping component.	N/A
8.10.6	The center to center distance between adjacent tracks should be at least 48 in. (1220 mm).	N/A
8.10.7	When the rolling portions of the hand-gripping component are enclosed within the track beam, the track assembly is exempted from the crush and shear requirements.	N/A
9	Areas Outside Soft Contained Play Equipment	
9.1	Areas immediately adjacent to all accessible parts of the SCPE shall have use zones which are free of obstacles and covered with resilient surfacing. The dimensions, configuration and fall heights or these use zones are defined in 9.2 – 9.5.	N/C
9.2	Entrances and Exits (Except Slides):	N/C
9.2.1	Use zones adjacent to all entrances and exits to the SCPE (except slides, which are addressed in 9.3) shall be free of obstacles and covered with resilient surfacing meeting the requirements of 9.2.4 for a minimum distance of at least 60 in. (1.5 m) from all portions of the entrance and exit which are outside of the contained area of the equipment	N/C
9.2.2	Use zones for entrances and exits shall be permitted to overlap and entrances and exits may	N/C



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	share use zones (for example, entrances and exits may be located in each others use zone).	
9.2.3	Use zones for entrances and exits shall be permitted to contain a barrier if such a barrier is parallel to the edge of the entrance or exit, and if the barrier is continuous and pliable or padded, or both (see Fig. A1.23).	N/C
9.2.4	Protective surfacing in use zones defined above shall meet Specification F1292 for the highest designated play surface outside of the contained area of the equipment.	N/C
9.2.5	Entrances and exits (except slides) which terminate within the SCPE are exempt from these requirements.	N/C
9.3	Slide Use Zones	N/C
9.3.1	Aslide use zone free of all equipment and obstructions shall be maintained around and 3 in. (76 mm) under all accessible parts of the slide. The slide use zone shall be covered with impact attenuating surfacing that meets the requirements of Specification F1292 for the highest designated play surface of the accessible parts of the slide or for 1 ft (300 mm) height, whichever is greater.	N/C
9.3.2	Open Slides: 9.3.2.1 Slides that do not have a completely bounded cross section (open slides) must meet the use zone requirements of Consumer Safety Performance Specification F1487, Section 9.6.	N/C
9.3.3	Enclosed Slides 9.3.3.1 Slides with a completely bounded cross section, except at the slide exit region, are enclosed slides. (1) The slide use zone for enclosed slides shall extend at least 60 in. (1.5 m) from all portions of the accessible parts of the slide, except directly in front of the slide exit (see Fig. A1.24). (2) This slide use zone shall be permitted to contain a barrier which is parallel to the edge of the slide, if the barrier is continuous and pliable and/or padded (see Fig. A1.25). The portion of the barrier that is beyond the slide use zone as defined in 9.3.3.2(1) need not be pliable and/or padded (see Fig. A1.26), except as required by 8.1.7. 9.3.3.2 The slide use zone directly in front of the slide exit shall be as follows: (1) If the length of the slide runout (measured from the 5° transition point to the end of the slide exit) is greater than or equal to 36 in. (910 mm), then the slide exit use zone in front of the slide exit shall extend at least 60 in. (1.5 m) from the end of the slide (see Fig. A1.27). (2) If the length of the slide runout (measured from the 5 degree transition point to the end of the slide exit) is less than 36 in. (910 mm), then the slide exit use zone in front of the slide exit shall extend at least 72 in. (1.8 m) from the end of the slide (see Fig. A1.27).	N/C
9.3.4	Play activities (for example, balls, activity panels, climbing devices) and transfer station parking places shall not be present in the slide exit use zone.	N/C
9.3.5	Slide use zones shall be permitted to overlap with other play equipment (including slide) use zones if the highest designated play surfaces of both components are 30 in. or less above the top of the protective surfacing. Slide use zones directly in front of slide exits shall not overlap (see Fig. A1.28).	N/C
9.4	Other Play Components Use Zones:	N/C
9.4.1	Play components with a designated play surface, other than slides and entrances and exits, which are outside the contained area but attached to the SCPE, shall have a use zone which extends 60 in. (1.5 m) from all parts of the component that is outside the SCPE. The use zone shall be covered with impact attenuating surfacing that meets Specification F1292 for	N/C



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	the highest designated play surface of the play component.	
9.4.2	Use zones of play components with a designated play surface, other than slides and entrances and exits, which are outside the contained area but attached to the SCPE, shall be permitted to overlap with other play component use zones (including slide and entrance and exit use zones) if the highest designated play surfaces of both play components are 30 in. (760 mm) or less above the top of the protective surfacing.	N/C
9.4.3	Shoe bins are not considered play components and do not require protective surfacing. Shoe bins should be placed in an area which discourages climbing.	N/C
9.5	Enclosure Materials:	N/C
9.5.1	External portions of the SCPE which serve only to enclose the equipment and contain no designated play surfaces are exempt from use zone requirements.	N/C
10.	Structural Integrity	
10.1	After conducting the tests in this section, there shall be no visible crack or breakage of any component and no form of permanent deformation of any component with the potential to adversely affect the structural integrity or safe use of the equipment.	Pass
10.1.1	As an alternate to the tests which follow, it is acceptable that a licensed architect or a licensed professional engineer certify through design calculations with accompanying seal, the integrity of the equipment if it were subjected to the test loads.	Pass
10.2	Loading Test Criteria After conducting the tests in this section, there shall be no visible crack or breakage of any component and no form of permanent deformation of any component with the potential to adversely affect the structural integrity or safe use of the equipment.	Pass
10.2.1	After conducting the tests in this section, there shall be no visible crack or breakage of any component and no form of permanent deformation of any component with the potential to adversely affect the structural integrity or safe use of the equipment.	Pass
10.3	Strength of Track and Trolley Ride Assemblies and Structures	N/A
10.3.1	Track ride assembly (track, trolley, connectors, suspending members, and handle) shall be installed in accordance with the manufacturer's installation instructions. The test load shall be attached to the handle of the trolley assembly using a loading strap or straps having the dimensions shown in Fig. A1.29. 10.3.1.1 For track ride intended for use by a single person, the load distribution device shall be centered on the handle assembly with the trolley assembly centered on the track length, and a vertical downward force of 605 lb shall be applied. The force shall be applied gradually and maintained for 5 min. 10.3.1.2 For track ride assemblies designated for use by more than one person, a load distribution device shall be placed at each designated user position and subjected to the test requirements of 10.3.1.1 simultaneously.	N/A
10.4	Components and Structures Subject to Vertical Loads	Pass
10.4.1	Determine the number of simultaneous users, n, of a component or structure as specified in this section. If n is not a whole number, round to the next largest whole number. Place n load distribution devices on the component or structure in a manner that simulates the anticipated load distribution. Simultaneously load each load distribution device with a downward vertical force, F, given by the following equation: $F = (250) \left(1 + \frac{1}{n} \right) \quad (1)$	Pass



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	<p>where: F = force/load distribution device, 250 = user weight, lb, and (1+1/n) =dynamic factor The force shall be applied gradually and maintained for a period of 5 min.</p>	
10.4.2	<p>Individual Surface</p> <p>10.4.2.1 This section applies to components such as platforms, crawl tubes, junction boxes and stair treads. Determine the component projected surface area, A. For a rectangular horizontal platform, A = (length) × (width). For other than horizontal surfaces, A = the projection of the component use area onto a horizontal plane. The component use area is the maximum component extents which are normally contacted during use. Use this value of A in Eq 2 or Eq 3 and determine the number of users, n, (round to the next largest whole number). Use this value of n in Eq 1 to determine the magnitude of each force to be applied.</p> <p>For A, ft² :</p> $n = \frac{A}{3.72} \quad (2)$ <p>For A, m² :</p> $n = \frac{A}{0.35} \quad (3)$ <p>10.4.2.2 Slide Beds</p> <p>Determine the number of users, n, as follows: n = L/36, where L equals the length of the slide bed (see Fig. A1.21) in inches, or n = L/910, where L equals the length of the slide bed in millimeters. (Round to the nearest whole number.) Place n load distribution devices equally spaced on the slide bed. Load each distribution device with a downward vertical force given by the equation in 10.4.1. The force shall be applied gradually and then maintained for a period of 5 min. After the load for each loading device has been calculated by the equation, multiply the load by the number of users to obtain anticipated load.</p>	Pass
10.5	Protective Barriers (Including Netting)	Pass
10.5.1	<p>Barriers Subject to Horizontal Loads</p> <p>Distributed Horizontal Load Test—Apply a horizontal force, F, in a direction perpendicular to the barrier and away from the enclosed structure. Apply the force at a height of 36 in. (910 mm) above the standing surface and evenly distributed over the entire width of the barrier. For barriers that are less than 36 in. (910 mm) high, apply the force 12 in. (300 mm) below the top. The test force is given as follows: F(lbf)=120W where W = the horizontal width of the barrier, ft.</p>	Pass
10.5.2	<p>Barriers Subject to Vertical Loads</p> <p>10.5.2.1 Distributed Vertical Load Test—Apply a force, F, in a direction downward and in line with the barrier. Apply the force 12 in. (300 mm) from the top and evenly distributed over the entire width of the barrier. The test force is given as follows: F(lbf)=120W where W = the horizontal width of the barrier, ft.</p> <p>10.5.2.2 No-climb netting or other non-climbable barriers are exempted from this requirement.</p>	Pass



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11.	Maintenance	
11.1	This section establishes maintenance and cleaning procedures for soft contained play equipment (SCPE).	N/C
11.2	Maintenance/Hygiene	N/C
11.2.1	The designer or manufacturer of each play system shall provide to the original owner/operator, maintenance/ hygiene instructions. 11.2.1.1 The manufacturer's maintenance instructions shall include recommendations for non-flammable, non-toxic cleaning and sanitizing solutions known to be compatible with materials used in the construction of the play equipment.	N/C
11.3	Manufacturer's Maintenance Instructions	N/C
11.3.1	Manufacturer's maintenance instructions shall include but not be limited to the following: 11.3.1.1 Description of recommended assembly and disassembly techniques and procedures as deemed necessary by the manufacturer to accomplish repairs and maintenance. 11.3.1.2 Parts and components shall be described and numbered for ordering purposes. 11.3.1.3 Recommended lubrication procedures and frequencies for the soft contained play equipment if applicable. 11.3.1.4 Description of the recommended inspection and maintenance procedures including frequency. 11.3.1.5 Description of recommended wear limits where deemed necessary by the manufacturer. 11.3.1.6 Recommendations for replacement fasteners, torque requirements, and appropriate precautionary information regarding the use of fasteners that have been loosened or retorqued.	N/C
11.4	Manufacturer's Operation Instructions to Owner/ Operator	N/C
11.4.1	The manufacturer's operation instructions shall include but not be limited to the following 11.4.1.1 Description of the designated, intended use of the soft contained play equipment including the function and operation of its major components. 11.4.1.2 Description of the recommended capacity in either weight or number of persons where applicable. 11.4.1.3 The location of the emergency evacuation points and equipment needed to assist in evacuations (for example, ladders and stepstools) and recommended evacuation procedure. 11.4.1.4 Recommendations for use restrictions relating to environmental conditions where applicable. It is possible that environmental conditions such as extreme temperatures, high winds, or rain may restrict use of some equipment.	N/C
11.5	Owner/Operator's Training Responsibilities Based on the manufacturer's recommendations, the owner/operator shall train employees performing the regularly scheduled maintenance of the soft, contained play equipment. This training shall include, but not be limited to, the following:	N/C
11.5.1	Training on specific tasks and responsibilities,	N/C
11.5.2	Inspection procedures,	N/C
11.5.3	Maintenance procedures,	N/C
11.5.4	Cleaning and sanitation procedures, and	N/C
11.5.5	Emergency evacuation procedures.	N/C
11.6	Protective Surfacing and Use Zone Maintenance	N/C
11.6.1	The owner/operator shall maintain the protective surfacing within the use zone of soft	N/C



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	contained play equipment in accordance with specifications contained in Specification F1292, appropriate for the fall height of each component subject to fall zone surfacing requirements. 11.6.1.1 The owner/operator shall maintain the surfacing within and around the use zones, entrances and exits of the play structure, free from extraneous materials that could cause injury, infection or disease, as well as debris, clothing and footwear	
11.7	Owner/Operator's Notification Responsibilities	N/C
11.7.1	The owner/operator of soft, contained play equipment shall promptly notify the manufacturer of any incident, failure, or malfunction which, in their judgement, seriously affects the continued proper operation of the soft, contained play equipment.	N/C
11.8	Access to Inaccessible Areas	N/C
11.8.1	The owner/operator shall ensure that all gates leading to inaccessible areas are locked at all times.	N/C
11.9	Signage	N/C
11.9.1	The owner/operator shall ensure that signage is properly displayed showing appropriate ages for the SCPE and the need for adequate supervision of children using the SCPE.	N/C
12.	Fire Safety	
12.1	Introduction:	N/C
12.1.1	The fire safety requirements of this section apply to soft contained play equipment in an indoor setting	N/C
12.2	Smoke Detection	N/C
12.2.1	The building shall be protected by an approved, automatic smoke detection system in accordance with NFPA 101 (Life Safety Code). Actuation of any smoke detection system device shall sound an audible alarm at a constantly attended location on the premises	N/C
12.3	Exit Signage in the Play Area:	N/C
12.3.1	It is the responsibility of the owner/operator that exit signs and chevron arrows shall be permanently affixed, plainly visible and illuminated upon exiting the equipment. Each exit sign and chevron arrow shall be pointing toward an exit from the building. The exit signs and chevron arrows shall be sized in accordance with the ANSI X535.4 specification and illuminated in accordance with NFPA 101 Life Safety Code.	N/C
12.4	Emergency Lighting:	N/C
12.4.1	It is the responsibility of the owner/operator that each access/egress point of the SCPE shall be illuminated by emergency lighting in accordance with NFPA 101 Life Safety Code. Access/egress to nonuse zones is exempt	N/C
12.5	Material Specifications:	N/C
12.5.1	Rigid Materials Material used for rigid components (for example, tubes, window, panels, junction boxes, pipes, slides, decks, etc.) shall be tested to UL 94, Test for Flammability of Plastic Materials for Parts, Devices, and Appliances. Results shall be HB (horizontal burn) classification.	N/C
12.5.2	Foam Padding (Excluding Pipe Foam) Materials used for foam padding (excluding pipe foam) shall meet the requirements of California Technical Bulletin 117, Section A, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture. Foam padding shall be covered by a fabric, coating, or film that meets the specifications of NFPA 701, Flame Resistant Textiles and Films.	N/C
12.5.3	Foam Padding Used for Pipes	N/C



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Clause	Test Method & Test Requirement	Rating
	Materials used for pipe foam shall meet the requirements of UL 1975, Fire Tests for Foamed Plastics Used for Decorative Purposes. An 8 ft length of the material used as pipe foam shall be tested. The peak heat release rate shall not exceed 100 kW.	
12.5.4	Ball Pool Balls Ball pool balls shall meet the requirements of UL 1975, Fire Tests for Foamed Plastics Used for Decorative Purposes. The minimum specimen test size shall be 36 by 36 in. (910 by 910 mm) by an average of 22 in. (560 mm) deep, and the balls must be held in a box made of chicken wire mesh. The peak heat release rate shall not exceed 100 kW.	N/C
12.5.5	Knitted and Woven Fabrics Knitted and woven fabrics, whether coated or uncoated (such as netting, webbing, and fabrics, etc.) shall meet the specifications of NFPA 701 Standard Methods of Fire Test for Flame Resistant Textiles and Films. The fabric shall be tested by Method No. 1 if it weighs 21 oz/yd ² (700 g/m ²) or under, and by Method No. 2 if it weighs over 21 oz/yd ² (700 g/m ²).	N/C
12.6	Electrical Devices:	N/C
12.6.1	All electrical devices shall meet applicable local codes.	N/C
12.6.2	Field Assembled Electrical Devices Field assembled electrical devices or accessories (for example, lighting, sound generation, video devices, etc.) shall be assembled from UL listed or equivalent components in accordance with the National Electrical Codes (NEC).	N/C
12.6.3	Factory Assembled Electrical Devices Factory assembled electrical devices or accessories (for example, lighting, sound generation, video devices, etc.) shall be UL listed or equivalent.	N/C
12.6.4	Electric Supply All electric supplies must be positioned outside of the accessible area and not be within reach.	N/C
12.7	Protective Surfacing Protective surfacing used in soft contained play equipment shall be rated Class II according to Test Method E648.	N/C
13.	Evacuation	
13.1	Evacuation Route The shortest adjusted exit path length (calculated as the sum of horizontal and vertical travel distances through the SCPE minus half the length of any slides in this path) from any point within the SCPE to the nearest exit or emergency access/egress pathway shall be no more than 40 ft (12 m).	Pass
13.2	Emergency Access/Egress Pathway	Pass
13.2.1	An emergency access/egress pathway is a clear and unencumbered path which leads directly into or out of the play equipment in a continuous manner.	Pass
13.2.2	An emergency access/egress pathway shall have a cross section of not less than 39 in. (990 mm) in width, height, or diameter.	Pass
13.3	Dead Ends	N/A
13.3.1	Dead ends in which the narrowest cross section is equal to or greater than 39 in. (990 mm) shall have a maximum length of 240 in. (6.1 m), measured along the center line, from the passage entry point to the termination of the dead end. (See Fig. A1.30.)	N/A
13.3.2	Dead Ends with Cross Sections Less Than 39 in. (990 mm): 13.3.2.1 Cross Sectional Dimensions:	N/A



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Clause	Test Method & Test Requirement	Rating
	<p>(1) No tubular dead end shall have a cross section of less than 23 in. (See Fig. A1.31.)</p> <p>(2) Rectangular dead ends shall have a minimum horizontal cross section of 23 in. and a minimum vertical cross section of 40 in., except between vertical pipe columns, where the horizontal cross section may be reduced to 20 in. for a running distance of not more than 4 in. (See Fig. A1.32 and Fig. A1.33.)</p> <p>13.3.2.2 Dead End Lengths:</p> <p>(1) Dead ends with no cross section equal to or greater than 39 in. (that is, with no turnarounds) shall have a maximum length of 72 in., measured along the center line, from the passage entry point to the termination of the dead end. (See Fig. A1.34.)</p> <p>(2) Dead ends with a turnaround at the termination of the dead end shall have a maximum length of 120 in., measured along the center line, from the passage entry point to the termination of the dead end. A turnaround is an area with minimum dimensions of 39 by 39 in. or a sphere with a minimum diameter of 39 in. (See Fig. A1.35.)</p> <p>(3) Dead ends with multiple turnarounds shall have maximum path lengths, measured along the center line, from the passage entry point to the terminations of the dead end, of not more than 120 in. (See Fig. A1.36.)</p>	
14.	Accessibility	
14.1	Soft contained play equipment shall comply with The Americans with Disabilities Act Accessibility Guidelines (ADAAG) for Buildings and Facilities; Play Areas	N/C
15	Keywords	
15.1	entanglement; entrapment; fire safety; hazard; maintenance; protrusion; slides; soft contained play equipment	N/C
ANNEX (Mandatory Information)		
A1. FIGURES		

Rating key:

Pass	Meet the requirement	N/A	Not Applicable
Fail	Not meet the requirement	N/C	Not conducted as per client's requirement

Remark:

- Since the data and / or information above division line of front page is provided by the applicant, the relevant results or conclusions of this report are only made for these data and / or information, SGS shall not be responsible for the authenticity and integrity of such data and information and the validity of the results and / or conclusions arising therefrom. Testing results only apply to the sample as received.
- The declaration of conformity is based on acceptance limits chosen based on simple acceptance ($w = 0$, $AL = TL$).
Statements of conformity are reported as:
Passed - The measured values were observed in tolerance at the points tested.
Failed - One or more measured values were observed out of tolerance at the points tested.
- As requested by client, test according to ASTM F1487-21 not including clause 4.1, clause 7.1, clause 9, clause 10, clause 11, clause 13, clause 14, clause 15, clause 16, ASTM F1918-21 not including clause 4.1, clause 5.1, clause 5.2, clause 9, clause 11, clause 12, clause 14, clause 15.



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Sample Photo:



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Product Size: 2540mmx4050mmx2830mm

Product Weight: 800kg

End of Report



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