Test Report No.: CZHL260400515001PG Date: APR. 22, 2026

Wenzhou Dream Garden Amusement Equipment Co., LTD
Room 06-4, 10th Floor, Building A3, Wenzhou Wanyang Science and Technology City, No.2999 Nanyang Avenue, Yaoxi Street, Longwan District, Wenzhou City, Zhejiang Province

The test result is copied from the test report No.: CZHL260300356801PG, Date: APR. 20, 2026.
The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description	:	indoor playground
Sample Quantity	:	1 SET
Manufacturer	:	Zhejiang Baihe Industrial Co., Ltd.
Supplier	:	Zhejiang Baihe Industrial Co., Ltd.
Country of Origin	:	China
Country of Destination	:	Canada
Requested Age Grading	:	3-12
		**********
Sample Receiving Date	:	MAR. 23, 2026
Testing Period	:	MAR. 23, 2026 T0 APR. 10, 2026
Testing Performed	:	SELECTED TEST(S) AS REQUESTED BY APPLICANT

No	Test Requirement	Conclusion
1	CSA Z614:20: National Standard of Canada Children's playground equipment and surfacing	Pass See remark

*** FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) ***

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

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Test Conducted:

CSA Z614:20: National Standard of Canada Children's playground equipment and surfacing

Scope:

1. This Standard provides requirements for public-use playground equipment intended for use by children aged 18 months to 12 years, with anthropometric limits based on the 95th percentile.

   Notes:

   1) The level of challenge required and desired by children varies enormously with age, physical development, and emotional development; therefore, it is almost impossible to design a piece of playground equipment that meets the needs of all children. Children younger than 18 months and children aged 13 years and older do not usually use the equipment covered in this Standard.

   2) The sixth year of a child's life (when the child is five years old) is accepted as a transitional year. Consequently, the requirements in this Standard are split into two age groupings: 18 months to 5 years and 5 years to 12 years. The overlap of the 5-year-old child is deliberate and acknowledges the transitional nature of the sixth year of life.
2. This Standard takes into account the physical size, special characteristics, and developmental needs of children so that appropriate and challenging play experiences are provided.
3. This Standard applies to outdoor public-use playground equipment found at schools, parks, childcare facilities, institutions, multiple-family dwellings, private resorts and recreation developments, restaurants, and other areas of public use. See Clause 3.
4. This Standard contains recommendations on technical requirements and practices applicable to the design, manufacture/construction, installation, maintenance, and inspection of public-use playground equipment and its related spaces. The provider of each of these areas is responsible for meeting the applicable requirements and recommendations of each, but it is the owner/operator's responsibility to confirm if the requirements and recommendations of this Standard are followed.
5. This Standard is intended to promote and encourage the provision and use of playgrounds that are well designed, well maintained, innovative, and challenging and, in so doing, contribute to the development of healthy children.
6. The requirements of this Standard are intended to minimize the likelihood of life-threatening or serious injuries by mitigating the identified hazards typically presented in various types of playground environments and play components.

   Note: Annex J provides references for learning more about hazard identification and risk/benefit assessments and examples of playground-focused applications.
7. This Standard applies to

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a) public-use playgrounds built, protective surfacing installed, and public-use playground equipment manufactured after the date of publication of this edition; and

b) additions to, and replacement parts for, public-use playgrounds installed after the date of publication of this edition.

8. This Standard provides requirements for outdoor public-use playground equipment in a playground that is provided for children for play, although, in some cases, this playground equipment was not originally produced for that purpose. Other objects or furnishings not primarily intended for play, such as fences, benches, tables, landscape elements, independent shade structures, borders intended to contain protective surfacing, and plant and natural materials, are not covered. Loose play materials are also not covered.

   Note: The equipment configurations shown in the figures in this Standard are examples only. Configurations other than those shown can be designed and built to meet the requirements specified in the clauses of this Standard.

9. This Standard does not apply to the following:

   a) sport, fitness, or gymnasium environments;

   b) slides that end in water;

   c) soft, contained play equipment that has controlled public access, such as that provided in commercial establishments (e.g., restaurants and department stores);

   d) play equipment intended for backyard use;

   e) amusement rides;

   f) family daycare as defined by provincial/territorial childcare regulations; and

   g) adventure playgrounds as defined in the following note.

   Note: Adventure playgrounds are a specific type of non-commercial area for play. They are fenced and secured and have constant supervision during use by “playworkers”. They are characterized by a developmental approach supporting free play; the absence of adult-built playground equipment; and the provision of construction materials, tools, and loose parts.

10. In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; “may” is used to express an option or that which is permissible within the limits of the Standard.

    Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

    Notes to tables and figures are considered part of the table or figure and may be written as requirements.

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Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

11. The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only. Unless otherwise specified, a tolerance of ±2% is applied to each dimension presented in this Standard.

Sample size/weight::	5000 x 3750 x 4000 mm / 375 kg (claimed by client)	Total number of users:	10
Age range:	3-12	Number of tested samples:	1

Clause	Test Method & Test Requirement	Rating
2	Reference publications	
3	Definitions	
4	User age groups	P 3-12
4.1	Equipment designed for a specific age group (18 months to 5 years, 5 years to 12 years, and 18 months to 12 years) shall meet the requirements for the designated age group.	P
4.2	For the owner operator, taking into account the playground equipment used, the needs and abilities of the children, and the level of supervision, the user age groups are intended as guidelines only. **Notes:** 1) *Playgrounds play an important role in meeting the interwoven developmental needs of all children—physical, social, cognitive, and emotional. Playground equipment allows children to move their bodies in new and challenging ways—up and down, over and under, balancing, using upper body strength, rocking, rotating, sliding, swinging—developing strength, coordination, confidence, and activity patterns that can last a lifetime. Playgrounds create a special place that invite children to explore new ideas, social skills, and friendships.* 2) *Early childhood is a time of rapid development because young children explore the world with great curiosity and intensity. During that period, both gross and fine motor movements change from awkward to agile.* 3) *Play patterns move from solitary to group play.* 4) *The challenge and opportunity for playground equipment is to provide play experiences that are appropriate and challenging across the wide range of ages, sizes, and developmental and play needs of children between 18 months and 12 years.* 5) *See Annex A for more information on playgrounds, playground equipment, children's development and supervised play.*	P
5	Levels of supervision Children should be appropriately supervised based on their age, development,	P

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Clause	Test Method & Test Requirement	Rating
	and abilities. Different playground settings could offer different levels of supervision to support and enhance play opportunities. Active supervision can address inappropriate behaviours and reduce the likelihood of injuries.	
6	Compliance	P
6.1	Public-use playground equipment presented as complying with this Standard shall meet all applicable requirements specified herein. Anyone claiming compliance with this Standard shall keep such essential records as are necessary to document the claim that the requirements of this Standard have been met.	P
6.2	Unless otherwise specified, a tolerance of ±2% shall be applied to each dimension presented in this Standard.	P
7	Materials	P
7.1	General requirements Playground equipment shall be manufactured and constructed only of materials that have a demonstrated durability in the playground or a similar outdoor setting. Any new material shall be documented or tested appropriately for durability by the playground equipment manufacturer.	NC
7.2	Metals Metals that are subject to structural degradation, such as rust or corrosion, shall be painted, galvanized, or otherwise treated.	NC
7.3	Coatings All paints or other similar finishes shall be non-toxic.	NC
7.4	Natural materials	NC
7.4.1	Wood Wood that is intended for playground equipment and that is not naturally rot- and insect-resistant shall be treated to resist rot and insect attack. Chromated copper arsenate (CCA), creosote, pentachlorophenol, tribututyl tin oxide, and surface coatings that contain pesticides shall not be used for playground equipment. Natural logs, branches, or similar that are provided (with or without manufacturing or machining) shall be selected for durability as well as structural integrity as per the requirements of Clause 9. **Note:** *Consideration of dimensional size, shape, and weight is acceptable criteria for the natural stability requirements of Clause 9.2.*	NA
7.4.2	Stone	NA

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Clause	Test Method & Test Requirement	Rating
	Rocks, stones, and/or boulders that are intended for use as play equipment shall be purposely and individually selected for their intended function before installation. Natural and/or cut stone materials shall be selected for durability as well as structural integrity in accordance with the requirements of Clause 9. **Note:** *Consideration of dimensional size, shape, and weight is acceptable criteria for the natural stability requirements of Clause 9.2.*	
7.4.3	Water Playground equipment utilizing water shall have a means of drainage to eliminate unintended standing/ponding water. **Note:** *The issue of standing or stagnant water presents a risk of injury as bacteria (e.g., giardia) and insect larvae (e.g., mosquito) can generate quickly if left unattended.*	NA
7.5	Plastics Plastics shall be able to withstand normal playground use at 5th and 95th percentile temperature extremes for both region and season without adverse effects. They shall be resistant to ultraviolet degradation.	NC
7.6	Ropes Ropes shall be selected on the basis of durability, strength, elasticity, weight, resistance to vandalism, potential to cause skin burns or abrasion, and requirements for maintenance. They shall be resistant to ultraviolet degradation. If ropes are mounted permanently on support(s), they should be steel cored or equivalently cut-resistant.	NA
7.7	Hazardous substances The manufacturer and owner/operator shall ensure that users of the playground equipment cannot ingest, inhale, or absorb through body surfaces potentially hazardous amounts of substances as a result of using the playground.	NC
7.8	Components Fasteners and connecting and covering devices shall not loosen or shall not be removable without the use of tools. Lock washers, self-locking nuts, or other locking means shall be provided for all nuts and bolts. Hardware in moving joints shall also be secured against unintentional loosening.	P
7.8.1	Fasteners Fasteners and connecting and covering devices shall not loosen or shall not be removable without the use of tools. Lock washers, self-locking nuts, or other locking means shall be provided for all nuts and bolts. Hardware in moving joints shall also be secured against unintentional loosening.	P

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Clause	Test Method & Test Requirement	Rating
7.8.2	Moving suspended elements	NA
7.8.2.1	General Moving suspended elements shall be connected to the fixed support with bearings or bearing surfaces that serve to reduce friction or wear.	NA
7.8.2.2	Steel cable Cable ends shall be inaccessible or capped to prevent injury from frayed wires. Cables and steel-cored ropes shall be protected to prevent fraying, loosening, unravelling, or excessive shifting of joints.	NA
7.8.3	Tires Tires shall not trap water. If steel-belted tires are used, they shall be inspected regularly for possible protrusions and sharp edges (e.g., exposed steel belts).	NA
8	Installation	NC
8.1	Designer's or manufacturer's responsibilities The designer or manufacturer shall provide detailed instructions for the installation of each playstructure designed or provided, as well as a complete parts list.	NC
8.2	Owner's/operator's or installer's responsibilities	NC
8.2.1	All playstructures shall be installed in accordance with the manufacturer's or designer's instructions.	NC
8.2.2	Protective surfacing shall be installed within the protective surfacing zone of each playstructure, in accordance with Clause 10 and, at minimum, shall meet the energy-absorbency requirement specified for the fall height of each component.	NC
8.2.3	A comprehensive inspection of the playstructure and protective surfacing shall be performed by the owner/operator or its designate before first use.	NC
8.3	Construction	NC
8.3.1	Foundations When footings are used, they shall be designed to reduce frost heave, with smooth sides and no flare at the top. Prefabricated formwork shall be used where smooth-sided footings cannot be dug. Where the play equipment is not vertically shielding the foundations, the foundations shall be located below the full depth of the protective surfacing.	NC
8.3.2	Procedures	NC

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Clause	Test Method & Test Requirement	Rating
	8.3.2.1 During construction, the site and all of the materials on it shall be secured when unattended to prevent children from playing on the site. **8.3.2.2** Installation of playground equipment shall be in accordance with the manufacturer's or designer's instructions and procedures. **8.3.2.3** The playground equipment shall not be used until the protective surfacing has been installed. **8.3.2.4** At the conclusion of installation, all joints and connections shall be checked to ensure that they are tight and secure. **8.3.2.5** All waste materials shall be removed from the playground before opening. No material shall be burnt on the site.	
9	Structural integrity	P
9.1	General	P
9.1.1	Structural integrity tests are intended to be conducted before the equipment begins to be used and are not intended to be performed as part of a routine maintenance program. Clause 9 specifies the performance tests used to determine structural integrity. Performance tests shall have a definite endpoint that can be physically measured, and safety factors shall be included in the loading criteria.	P
9.1.2	The manufacturer shall be responsible for ensuring compliance with the requirements of Clause 9 and providing documentation to the owner/operator.	P
9.2	Stability Under the most adverse conditions of use, the righting moment of any piece of equipment shall be at least 50% greater than any overturning moment and should be achieved through natural stability or appropriate anchoring.	P
9.3	Loading test criteria After conducting the tests described in Clauses 9.4.1 to 9.6.3, there shall be no visible cracks or breakage and no form of permanent deformation of any component that can adversely affect the structural integrity or use of the equipment. Hooks, shackles, rings, or links shall not have opened to more than 1 mm (0.04 in) after removal of the load.	P
9.4	Strength of swing components and structures	NA
9.4.1	Swing assemblies (i.e., the combination of swing seats, connectors, suspending members, and bearings/hangers) shall be installed in accordance with the manufacturer's installation instructions or supported in an equivalent manner.	NA

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Clause	Test Method & Test Requirement	Rating
	The test load shall be applied using appropriate load-distribution devices. The load-distribution device shall be either a loading block(s) or a strap(s) having the dimensions shown in Figure 1.	
9.4.2	For swing assemblies intended for single occupancy, the load-distribution device shall be centred on the seat, and a vertical downward force of 3330 N (748.58 lbf) shall be applied. The force shall be applied gradually, shall attain but not exceed 3330 N (748.58 lbf), and shall be maintained for 5 min.	NA
9.4.3	For swing assemblies intended for multiple occupancy, the load-distribution device shall be centred on each sitting position. A vertical downward force of 2700 N (606.96 lbf) shall be applied to each loading device simultaneously. The force shall be applied gradually, shall attain but not exceed 2700 N (606.96 lbf) per device, and shall be maintained for 5 min.	NA
9.4.4	For swing-supporting structures, a vertical downward force of 3330 N (748.58 lbf) for single-occupancy swings or 2700 N (606.96 lbf) multiplied by the number of intended users for multiple-occupancy swings shall be applied simultaneously at each swing location. The force shall be applied 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.	NA
9.5	Components and structures subjected to vertical loads	P
9.5.1	General Components and structures subjected to vertical loads shall be tested in accordance with Clauses 9.5.2 to 9.5.7.	P
9.5.2	General test The general test shall be conducted as follows: a) Determine the number of simultaneous users, *n*, of a component or structure, as specified in Clauses 9.5.3 to 9.5.7, as applicable. b) If *n* is not a whole number, round to the nearest whole number. c) 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*, determined as follows: $F = 1113(n + 1)/n$ when *F* is measured in N (metric) or $F = 250(n + 1)/n$ when *F* is measured in lbf (imperial) d) Apply the force gradually and maintain for a period of 5 min. e) Test individual longitudinal components of a structure in accordance with Clause 9.5.3. f) In addition, test the structure containing those longitudinal components in accordance with Clause 9.5.4. g) Test other structures using Clauses 9.5.5 to 9.5.7, as applicable.	P Platform load: 2618 kg

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Clause	Test Method & Test Requirement	Rating
9.5.3	Individual longitudinal components Individual longitudinal components include ladder rungs and turning/chinning bars and shall be testedas follows: a) Measure the length of the component, *L*, and determine the number of users (rounded to thenearest whole number), *n*, from the following table. **Determining the number of users for individual longitudinal components** **Length of component** / **Estimated number of users** *L* ≤ 610 mm (*L* ≤ 24.02 in) / *n* = 1 (*n* = 1) *L* > 610 mm (*L* > 24.02 in) / *n* = *L*/410 (*n* = *L*/16.1) b) After the number of users has been determined, apply this number to the applicable equation given in Clause 9.5.2. c) After the load for each loading device has been calculated, multiply the load by the number of users to obtain the anticipated load.	P
9.5.4	Structures containing two or more longitudinal components Structures containing two or more longitudinal components include vertical ladders, horizontal ladders, overhead climbers, and upper body components and shall be tested as follows: a) Count the number of longitudinal components, *LC*, and determine the number of users (rounded to the nearest whole number), *n*, from the following table. **Determining the number of users for a 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 b) After the number of users has been determined, apply this number to the applicable equation given in Clause 9.5.2. c) After the load for each loading device has been calculated, multiply the load by the number of users to obtain the anticipated load.	P
9.5.5	Individual surfaces Individual surfaces shall be tested as follow: a) Compute the surface area, *A*, and determine the number of users (rounded to the nearest whole number), *n*, using the following chart. **Determining the number of users for individual surfaces** **Surface area, m² (ft²)** / **Estimated number of users, metric (imperial)** *A* ≤ 0.09 (*A* ≤ 1) / *n* = 1 (*n* = 1) 0.09 < *A* ≤ 0.93 (1 < A ≤ 10) / n = 10.8 A (n = A) *A* > 0.93 (A > 10) / *n* = 10.8 (*A* + 0.93)/2 [n = (A + 10)/2] b) After the number of users has been determined, apply the number to the applicable equation given in Clause 9.5.2. c) After the load for each loading device has been calculated, multiply the load	P n=22

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Clause	Test Method & Test Requirement	Rating
	by the number of users to obtain the anticipated load.	
9.5.6	Slide bedways Slide bedways shall be tested as follows: a) Determine the number of users (rounded to the nearest whole number), *n*, in accordance with one of the following equations: *n* = *L*/915, where *L*l = length of the slide bed, mm, or *n* = *L*/36, where *L*l = length of the slide bed, in. b) Place *n* load-distribution devices, equally spaced, on the slide bed. c) Simultaneously load each distribution device with a downward vertical force given by the applicable equation in Clause 9.5.2. d) Apply the force gradually and maintain for a period of 5 min. e) After the load for each loading device has been calculated, multiply the load by the number of users to obtain the anticipated load.	P Load: 151 kg
9.5.7	Components with designated occupancy Components with designated occupancy shall be tested as follow: a) 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 applicable equation given in Clause 9.5.2. b) After the load for each loading device has been calculated, multiply the load by the number of users to obtain the anticipated load.	P
9.6	Components subjected to lateral loads	P
9.6.1	General Components subjected to lateral loads, such as guardrails, protective barriers, handrails, etc., shall be subjected to two separate load tests. The force shall be applied gradually and maintained for a period of 5 min.	P
9.6.2	Accidental concentrated load test A load-distribution device shall be placed on the component at the point that will produce the most adverse effect. A 2000 N (449.44 lbf) horizontal force shall be applied to the load-distribution device in a direction perpendicular to the projection of the component from the enclosed structure	P
9.6.3	Surge distributed load test A horizontal force, *F*, shall be applied in a direction perpendicular to the length of the component and away from the enclosed structure. The force shall be applied near the top of the component and shall be distributed evenly over the entire	P

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	length of the component. The test force shall be determined as follows: *F* = 2.19*L* when measured in N (metric), where *L*l = length of the component, mm, or *F*l = 150*L* when measured in lbf (imperial), where *L*l = length of the component, ft.	
9.7	Net climbers	NA
9.7.1	Engineering data The manufacturer or designer of the climbing net structure shall provide engineering data to confirm the adequacy of the anchoring system and structural design under load as defined in Clause 9.7.3.	NA
9.7.2	Guy wires or suspension wires Any net members that form an integral part of the support structure by acting as guy wires or suspension wires shall have vandal-resistant steel cores.	NA
9.7.3	Number of users for structural calculations	NA
9.7.3.1	a) for planes with inclination up to and including 60° from horizontal *n* = *Apr*/0.36 b) for planes with inclination greater than 60° from horizontal *n* = *A*/0.72 where *Apr*l = the area of a horizontal plane projection of the net, m2, and *A*l = the net area, m2	NA
9.7.3.2	In the case of spatial nets, the number of users, *n*, in a volume shall be calculated using the following formulas: a) for volumes where *V* ≤ 4.3 m3 *n* = *V*/0.43 b) for volumes where 4.3 m3 < *V* ≤ 12.8 m3 *n* = 10 + [(*V* – 4.3)/0.85] c) for volumes where *V* > 12.8 m3 *n* = 20 + [(*V* – 12.8)/1.46], where *V*l = the volume defined by the periphery of the playground equipment, m3, and the mass of each user is 75 kg.	NA
9.8	Alternatives to testing for structural integrity As an alternative to the tests described in Clause 9, it shall be acceptable for a licensed professional engineer to verify the integrity of the equipment to support the test loads specified in Clause 9.	NA
10	Surfacing	NC

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Clause	Test Method & Test Requirement	Rating
10.1	Energy absorbency of a surfacing material The surfacing material in the protective surfacing zone shall have a *g*max not exceeding 200 and a HIC not exceeding 1000 when tested for the defined fall height. The test methods specified in ASTM F1292-99 or CEN EN 1177:1997 shall be used for testing protective surfacing.	NC
10.2	Critical height All playground equipment with a fall height above the finished grade shall be located on a protective surface that extends around it to cover the protective surfacing zone. The surfacing material used within the protective surfacing zone of the piece of playground equipment shall have a critical height of at least the defined fall height. Manufacturers and/or owner-operators should have three temperature critical height values for specified surfacing products available. The test methods specified in ASTM F1292-99 shall be used for three temperature tests.	NC
10.3	Acceptability of various surfacing materials	NC
10.3.1	Annex D lists the characteristics, and outlines the advantages and disadvantages, of common surfacing materials. Hard surfacing materials, such as asphalt or concrete, shall not be considered suitable for use under and around playground equipment with any defined fall height, unless these materials are required as a base for a shock-absorbing unitary material, such as rubber mats or a poured-in-place material. Natural ground (such as earth, soil, and sod) can be considered as adequate fall height protection for elevated play elements with a fall height no greater than 450 mm (17.72 in), provided that the play element does not impart movement to the body of the user (e.g., swings, slides, rocking, springing, and rotating equipment).	NC
10.3.2	Owners/operators of playgrounds shall ensure the suitability of any surfacing material used, taking into consideration such factors as impact attenuation performance, accessibility (see Annex H), longevity, and the presence of contamination (e.g., pesticides, toxic materials, insects, disease, paint/coatings, heavy metals, and sharps). The merits of the available playground protective surfacing systems should be considered before purchase. At each stage of the process (i.e., selection, specification, acquisition, installation, maintenance, and repair), there are costs that should be balanced with the advantages and disadvantages of the surface system or combination of systems. Acceptable playground surfacing materials are available in the following basic types: a) Loosefill — These materials include, but are not confined to, sand, pea gravel, and shredded wood products. They can have acceptable shock-absorbing properties when installed at a sufficient depth. As loosefill materials can be sold for purposes other than playground surfacing, many vendors are unlikely to be able to provide information on their shock-absorbing performance. For that reason, tests shall be conducted to determine the relative shock-absorbing properties of loosefill materials commonly used as surfaces under and around	NC

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	playground equipment. The loosefill materials and the minimum depths of such materials listed in Table D.1 should be used. b) Unitary — These materials typically include synthetic turf (e.g., artificial grass), rubber mats, or a combination of rubber-like materials that are held in place by a binder that can be poured in place at the playground site and that cure to form a unitary shock-absorbing surface. Unitary materials are available from a number of different manufacturers, many of whom have a range of materials with different shock-absorbing properties. Persons wishing to install a unitary material as a playground surface shall request test data from the manufacturer. The test data should identify the critical height of the desired material. In addition, site requirements should be obtained from the manufacturer because some unitary materials require installation over a hard surface while others do not. Unitary surfacing will lose its protective capabilities, in terms of impact attenuation, over time and will need to be replaced. This fact should be taken into consideration at the time of purchase. Product performance, life expectancy, and maintenance requirements of the unitary surfacing systems shall be provided by the manufacturer. **Note:** *Product performance and life expectancy are dependent on the manufacturing, use, and maintenance of the unitary surfacing materials.*	
10.4	Maintenance of protective surfacing	NC
10.4.1	In accordance with Clause 10.1, the owner/operator shall maintain the protective surfacing within the protective surfacing zone of each piece of play equipment. The protective surfacing shall be appropriate for the fall height of each piece of equipment, in accordance with Clause 15.	NC
10.4.2	A method of containment for loosefill materials, such as a retaining barrier or excavated pit, shall be provided to help keep the materials in the intended protective surfacing zone.	NC
10.4.3	The owner/operator shall keep the protective surfacing within the protective surfacing zone of each piece of play equipment free from extraneous materials that can cause injury, infection, or disease.	NC
10.4.4	As loosefill materials can deteriorate and will become displaced in heavy-use areas (e.g., under swing sand the bottom of slides), regular monitoring and attention shall be required to ensure that proper material depth and grade are maintained.	NC
10.4.5	Loosefill protective surfacing shall be cleared, raked, and replaced or added at regular intervals, depending on the materials and local conditions. When adding loosefill protective surfacing material, attention shall be paid to preventing a “hard pan” situation. This is best avoided by ensuring that the base material is well worked and loosened. Engineered wood fibre should not be worked or loosened.	NC
10.4.6	Periodic site testing of installed protective surfacing shall be performed. When the age of the surfacing element is documented, the fall height shall be determined in accordance with the edition of the Standard in effect at the time of	NC

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	installation. When the age of the surfacing element is indeterminate, the fall height shall be determined in accordance with the edition of the Standard in effect at the time of the evaluation.	
10.4.7	All protective surfacing shall be replaced or repositioned when it is worn or ceases to function as intended.	NC
10.4.8	Standing/ponding water presents an attractive “play” item that can result in serious or life-threatening injuries; therefore, drainage is essential. Attention shall be paid to supplying drainage during planning, renovation, and those specific periods when standing/ponding water is present.	NC
10.4.9	Any protective surfacing disturbed during repairs shall be immediately restored in accordance with the requirements of this Standard.	NC
10.4.10	Winter weather conditions reduce the effectiveness of surfacing materials. These conditions shall be considered by the owner/operator.	NC
11	Inspection and maintenance	NC
11.1	General	NC
11.1.1	Budgeting Playground inspection and maintenance are integral parts of budgetary costing. The cost of inspection and maintenance shall be considered and incorporated into the budget at the time of design, purchase of equipment, and installation. See Annex E for an example of the annual cost considerations.	NC
11.1.2	Maintenance program A program of daily and monthly maintenance schedules shall be created by the owner/operator and strictly followed to promote a safe play environment and to minimize injuries to children. The maintenance schedule shall include preparation for summer use and any special preparations for winter.	NC
11.2	Maintenance	NC
11.2.1	A comprehensive maintenance program shall be developed for each playground. **Note:** *See Clause 16.4.2.*	NC
11.2.2	Owner identification for emergency situations and for notification of defective equipment and hazards shall be posted on the premises.	NC
11.2.3	A checklist may be used for inspection. Some manufacturers supply checklists for general or detailed inspections with their maintenance instructions to ensure that inspections are in compliance with the manufacturer’s specifications. All hazards or defects identified during inspections shall be repaired or replaced promptly. All repairs and replacements of equipment parts shall be completed in	NC

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	accordance with the manufacturer's instructions. Components shall be replaced with the correct replacement parts.	
11.2.4	A suggested maintenance/inspection checklist is included in Table B.1. However, because it addresses only general maintenance/inspection concerns, it is only one of the many elements to consider in the development of a comprehensive schedule and system of maintenance. For example, the checklist does not address equipment design and layout factors such as the risk of falls from equipment, moving impact incidents, or head entrapment. To evaluate the compliance of each piece of equipment and the playground as a whole, the detailed design recommendations of this Standard shall be used. The checklist in Annex B may be used only for general maintenance purposes, and more detailed inspections shall be conducted regularly.	NC
11.2.5	A record of any injury reported to have occurred on the playground shall also be collected. See Figure C.1 for an example of an injury report form. This will help identify potential hazards or dangerous design features that warrant attention.	NC
11.2.6	All equipment, facilities, and surfaces shall be inspected for potential defects and faults (examples of these are listed in Table B.2). The manufacturer's product specification shall be consulted for product performance and maintenance standards.	NC
11.3	Inspection of the playground	NC
11.3.1	**General** All equipment shall be inspected frequently for any potential hazards. Inspections shall include, but shall not be limited to, a) checking the entire playground area for hazardous debris or litter (e.g., animal waste and sharp objects); b) checking for any damage (e.g., any broken or missing components of equipment, anything tied to or added onto equipment, or other playground damage caused by vandalism or wear); c) checking for any broken, missing, or loose equipment (e.g., handrails, guardrails, protective barriers, steps, or rungs on ladders, and for damage to any fences, benches, or signs on the playground); and d) checking for strings or ropes of any kind and removing them. The inspections in Clauses 11.3.3 to 11.3.5 shall be performed by the owner/operator or its designate, and reports shall be prepared. Any special preparation for seasonal operations shall also be considered and documented.	NC
11.3.2	For each piece of equipment, the frequency of thorough inspections depends on the type of equipment, the amount of use, and the local climate. Based on the manufacturer's recommendations regarding maintenance schedules for each piece of equipment, a maintenance schedule for the entire playground can be created. The detailed inspections shall give special attention to moving parts and other components that can be expected to wear. Maintenance is intended not to address design criteria but rather to maintain existing design.	NC

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11.3.3	**Daily/weekly visual inspection** A visual inspection shall be performed by the owner, maintenance inspector, caregiver, or custodian on a daily basis, if possible, or at least once a week to identify defects or emerging problems.	NC
11.3.4	**Detailed monthly inspection** A detailed inspection shall be performed every month, and the results and actions taken shall be entered in a permanent record available for examination.	NC
11.3.5	Every year, a comprehensive written report shall be completed by the owner/operator or its designate. The report shall document the results of the daily/weekly and monthly inspections, and the actions taken and planned, if necessary. The results of any protective surfacing testing undertaken during the 12 months shall be included, along with any action taken. An owner/operator or designate may also undertake a comprehensive inspection every 12 months. If an annual comprehensive inspection is performed, the report shall document the results of the inspection and the actions taken. The annual report could be a compilation of monthly inspection reports.	NC
11.4	Repairs in playgrounds	NC
11.4.1	All repairs shall comply with this Standard. When a defect is observed, it shall be immediately reported and repaired. Details of the defect or problem and remedial action shall be recorded. If the repair takes time, all reasonable steps shall be taken to restrict access. Warning or danger signs alone shall not be acceptable. Damaged or worn components shall be repaired or replaced in accordance with this Standard.	NC
11.4.2	Maintenance and repairs to equipment and the replacement of components shall be performed in accordance with the manufacturer's recommendations. See Table B.3 for a list of maintenance and repair issues to consider.	NC
12	Performance requirements	P
12.1	Tolerances **12.1.1** All measuring probes, gauges, and templates specified in Clause 12 shall have a tolerance of ±0.5% applied to each dimension. **12.1.2** All tests performed and measurements taken as specified in Clause 12 shall pass using any specific probe, gauge, or template that meets the required dimensions and tolerances. **12.1.3** All tests performed as specified in Clause 12 shall be applied only within the	P

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	volume defined by the protective surfacing zone surrounding each playstructure and to a height of 2.1 m (82.68 in) above the highest underlying designated play surface or pivot points of swings.	
12.2	Head and neck entrapment	P
12.2.1	General requirements **12.2.1.1** To reduce the risk of accidental head or neck entrapment caused by either a head-first or feet-first entry into an opening, public playground equipment shall be designed and constructed or assembled so that any accessible opening shall meet the performance requirements of Clause 12.2. **12.2.1.2** Openings between the protective surfacing and the bottom edge of the equipment (e.g., rails, platforms, steps) are exempt from this requirement, as indicated by Figure 2. **12.2.1.3** Enclosed swing seats and swing seats designed with removable supports or adjustable elements to hold the user upright or prevent falling out are exempt from Clause 12.2.	P
12.2.2	Accessible openings **12.2.2.1** A completely bounded rigid opening is accessible when a torso test probe (see Figure 3) can be inserted into the opening to a depth of 101.60 mm (4.0 in) or more. **12.2.2.2** The torso probe (see Figure 3) shall be placed in the opening with the plane of the base of the probe parallel to the plane of the opening. It shall be rotated to its most adverse orientation (i.e., where the major axis of the base of the probe is parallel to the major axis of the opening). If the torso probe can be inserted into the opening to a depth of 101.60 mm (4.0 in) or more, the head probe (see Figure 4) shall be placed in the opening with the plane of the base of the probe parallel to the plane of the opening. An opening shall have passed this test if a) the opening does not admit the torso probe when it is rotated to any orientation about its own axis; or b) the opening admits both the torso probe and the head probe. An opening shall have failed the test if the opening admits the torso probe but does not admit the head probe. **12.2.2.3** Completely bounded openings that are accessible shall also meet the requirements for angles outlined in Clause 12.2.5.	P
12.2.3	Non-rigid completely bounded openings **12.2.3.1** A non-rigid opening, such as, but not limited to, those found in flexible nets, tarps, and plastic enclosures, is considered accessible if a torso probe	P

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	penetrates the opening to a depth of 101.60 mm (4.0 in) or more when tested in accordance with the test procedure outlined in Clause 12.2.2.2 (see Figures 3 and 4 for probe dimensions). **12.2.3.2** The torso probe shall be placed in the opening, tapered end first, with the plane of its base parallel to the plane of the opening. The probe shall be rotated to its most adverse orientation (i.e., where the major axis of the base of the probe is parallel to the major axis of the opening). A force of 222.41 N (50 lbf) shall be applied to the probe to attempt to pass it through the opening. If the base of the probe passes through the opening, the head probe shall be placed in the opening, tapered end first, with the plane of its base parallel to the plane of the opening. A force of 222.41 N (50 lbf) shall be applied to the probe to attempt to pass it through the opening. A non-rigid opening shall pass the test if a) 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 b) the opening allows full passage of the torso probe and also allows the head probe to pass through completely. A non-rigid opening shall fail the test if the opening allows full passage of the torso probe but does not admit the head probe. **12.2.3.3** If the opening admits the head probe, each portion of its boundary shall be evaluated for the requirements for partially bounded openings specified in Clause 12.2.4.	
12.2.4	Partially bounded openings **12.2.4.1** A partially bounded opening is considered accessible if any of the conditions outlined in Clauses 12.2.4.2 and 12.2.4.3 for accessibility exist. **12.2.4.2** If the unbounded part of the opening is between 47.63 and 228.60 mm (1.875 and 9.0 in) in width when measured perpendicular to each surface, the opening shall be considered accessible and shall meet the requirements of the test method described in Clause 12.2.4.3. **12.2.4.3** The “A” portion of the test probe (see Figure 5) shall be inserted along the centreline of the opening in what has been determined to be the most adverse orientation so that the centreline of the template follows the centreline 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. The presence of simultaneous contact between the sides of the template shall be determined through visual inspection. If there is simultaneous contact, the opening fails the test and shall be considered accessible. An opening that fails using the “A” portion of the template shall be tested using the “B” portion (see Figure 5). The plane of the “B” portion of the test template	P

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	shall be positioned between, and perpendicular to, the plane of the boundaries of the opening. If the template fits completely within the boundaries, the opening shall fail the test and shall be considered hazardous, unless it permits the passage of the 228.60 mm (9.0 in) head probe (see Figure 4). If the template does not fit within the boundaries of the opening (defined as the opening outlined by the contact points of the "A" portion of the template), the opening shall pass and shall not be considered accessible. **Note:** *Annex I provides a possible testing protocol for partially bound openings.* **12.2.4.4** The probe shall be made of any rigid material 19.05 mm (0.75 in) thick. **12.2.4.5** If the lowest interior boundary that is immediately adjacent to the opening is horizontal or slopes downwards, the opening shall be considered to be an inverted partially bounded opening and shall be exempt from the requirements of Clause 12.2.4. **12.2.4.6** The following shall be exempt from the requirements of Clause 12.2.4: a) inverted partially bounded openings (see Clause 12.2.4.5); b) partially bounded openings that form "V" angles that are less than 55° where the apex of the angle is formed by an inclined or vertical climbing surface and a rope, chain, or cable, if the rope, chain, or cable is in contact with the inclined surface at or below the protective surfacing at the point of the formed "V" angle; and c) partially bounded openings where simultaneous contact of the "A" portion of the template is less than 610 mm (24 in) above the protective surfacing.	
12.2.5	Angular portions of openings **12.2.5.1** Angles formed by the surfaces of an opening [i.e., adjacent surfaces or surfaces that intersect when projected with a distance greater than 228.60 mm (9.0 in) between surfaces] shall be at least 55°, unless one of the conditions specified in Clause 12.2.5.2 exists. **12.2.5.2** The following shall be exempt from the requirements of Clause 12.2.5.1: a) inverted angle or "V" condition — a "V" that is inverted. A "V" is considered inverted if the lower adjacent leg forming the "V" is horizontal or slopes downwards from the apex (see Figure 6); and b) filled apex condition — "V" angles less than 55° where the apex of the angle is filled to the point at which the head probe (see Figure 4) cannot contact both surfaces of the angle simultaneously when the probe is rotated to any orientation about its own axis (see Figure 6).	P
12.3	Sharp points, sharp edges, protrusions, and surfaces	P
12.3.1	General	P
12.3.1.1	There shall be no accessible sharp points or sharp edges.	P

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12.3.1.2	Unless otherwise covered, the exposed open ends of all tubing shall be covered with caps or plugs that cannot be removed without the use of tools unless the tube is a) resting on the ground; or b) an integral part of a play opportunity. All tube ends, open or covered, shall meet the requirements of Clause 12.3.3 for protrusions and projections. **Note:** *Examples of tubes that provide play opportunities are musical tubes, chimes, and sand chutes.*	P
12.3.1.3	Any exposed bolt end shall not protrude beyond the face of the nut more than two threads after trimming and peening by the installer. A bolt end with more than two threads exposed shall be exempt if it is inaccessible. It shall be considered inaccessible when none of the three protrusion gauges (see Figure 7) can pass over it, or when the bolt end is recessed and the 88.90 mm (3.5 in) outside diameter protrusion gauge cannot be made to contact the bolt end when the outside curve of the gauge is placed over the recessed area (see Figure 11). A bolt end that protrudes beyond the face of the nut and is cut off to conform to the thread requirement shall be free of burrs and sharp edges. If smooth-finished caps are used, the length of the protruding bolt end shall be such that the cap or covering fits flush against the nut or surrounding surface.	P
12.3.2	Sharp points and sharp edges A minimum radius of curvature of 6.35 mm (0.25 in) for corners and edges of suspended members should be observed. This recommendation does not apply to belts, straps, ropes, and similar flexible components.	P
12.3.3	Protrusions and projections **12.3.3.1 General** When tested in accordance with Clause 12.3.3.3, there shall be no protrusion on any playstructure extending beyond the face of any of the three test gauges having the dimensions shown in Figure 7. A manipulative device attached to a flexible rope, cable, or chain shall be exempt from meeting the projection criteria using the large 76.2 mm (3.0 in) interior diameter projection gauge. The use of the smaller gauges shall still apply. **12.3.3.2 Projections** A projection is not accessible and is not a protrusion when it is recessed or located in a manner that prevents any of the protrusion gauges (see Figure 7) to be placed over it (see Figures 8 and 11). **12.3.3.3 Test method for determining protrusion hazards** Each of the three gauges (see Figure 8) shall be successively placed over each accessible projection in all orientations to determine if the projection extends beyond the face of the gauge. The projection shall fail the test if it protrudes beyond the face of any of the gauges (see Figure 8).	P
12.3.4	Surfaces **12.3.3.4.1** There shall be no protrusions in the potential impact region of the front and rear surfaces of suspended members of swing seats (see Figure 12).	P

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	12.3.3.4.2 The suspended member shall be tested in all positions of its intended travel. The gauge (see Figure 12) shall be oriented vertically with its axis parallel to the path of travel and placed over any protrusion that is accessible at any point along the path of travel. **12.3.4 Surfaces** No surface intended for seating or sliding shall contain rough textures or joints capable of cutting or abrading human skin.	
12.4	Entanglement	P
12.4.1	Protection against entanglement In areas of uncontrolled motion (e.g., on a slide or sliding pole), there shall be no entanglement hazards that can entangle drawstrings or other clothing.	P
12.4.2	Projections from a horizontal plane A projection meeting both of the following conditions shall be considered an entanglement hazard: a) one of the three protrusion gauges (see Figure 7) passes over the projection and contacts the initial surface; and b) angles between 0° and 95° project upwards from a horizontal plane more than 3 mm (0.12 in) (see Figures 9 and 10). The thickness of the protrusion test gauge (see Figure 12) can be used to determine if an entanglement hazard exists.	P
12.4.3	Exposed bolt end projections Any accessible bolt end projecting beyond the face of the nut more than two full threads shall be considered an entanglement hazard. A bolt end shall be considered inaccessible and not an entanglement hazard when the bolt end is recessed and the 88.90 mm (3.5 in) protrusion gauge (see Figure 7) cannot be made to contact the bolt end when the outside curve of the gauge is placed against the recessed area (see Figure 11).	P
12.4.4	Projections that increase in size Any projection that fits within any of the three gauges (see Figures 7 and 8) and that increases in size from the initial surface to the outer end shall be considered an entanglement hazard.	P
12.4.5	Connecting devices **12.4.5.1** When closed, connecting devices, such as, but not limited to, S-hooks, pelican hooks, and C-hooks, shall not be considered entanglement hazards. Such devices are considered closed when there is no gap greater than 1 mm (0.04 in) when measured with a feeler gauge (see Figure 13). **12.4.5.2** An S-hook shall be considered to be an entanglement hazard (see Figure 13) if	P

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	it does not meet the following conditions: a) No portion of the closed end of the lower loop shall project beyond the vertical projection of the upper loop. b) The upper loop shall align, partially align, or completely overlap the connector body. If the upper loop completely overlaps the connector body, it shall not extend past the connector body. c) The lower loop shall align with the connector body and shall not overlap it in any way.	
12.4.6	Slides and protrusions adjacent to slides **12.4.6.1 Toggle test description** **Note:** *See Figures 14 and 15.* The requirements in Clause 12.4.6 shall apply to slides, their methods of attachment, slide enclosures devices, slide transition areas, and sliding poles. The test device toggle shall comply with Figure 15, and the test device cord shall comply with Figure 14 [i.e., 3 mm (0.12 in) in diameter, 400 mm (15.75 in) in length, and 25 mm (0.98 in) maximum post diameter]. The following test method applies to Clauses 12.4.6.2, 12.4.6.3, and 12.4.7: a) Grasp the cord near the toggle. Position the toggle above or adjacent to the point to be tested. With the toggle at rest, release the cord, allowing the toggle to drop vertically (under the influence of its own weight) at the point to be tested. Grasping the toggle and/or swinging the cord is not permitted. b) With the toggle at rest, move the test device slowly (at an approximate rate of 150 mm/s or 5.91 in/s) in the intended direction of travel of the user. Do not apply any additional initial force to wedge the toggle or cord into any opening. c) Test all positions within the range of the test device. Move the test device slowly in the direction of expected movement. Ensure that the pole of the test device remains in the vertical position and the application of both the toggle and cord is influenced solely by its own weight. Ensure that no additional initial force or influence is applied to wedge the toggle or the cord into any opening. d) If the test device is obstructed, apply a maximum force of 50 N (11.24 lb) for a period of up to 10 s in the direction of the expected movement of the user. If the applied force causes the obstructed test device to release from the test location, that location passes the test. e) Test all potential entanglement locations twice. If a failure (i.e., obstruction that cannot be released as per Item d), occurs during one of the two tests at the same location, the location fails the test. Record all failures and report for corrective action. **12.4.6.2 Sliding section bedway** Place the base of the test device, shown in Figure 16, on the slide sitting section with its centre located 200 mm (7.87 in) back from the point where the slide bedway begins to slope downwards beyond 18° from horizontal and at the appropriate lateral location as described in Items a) and b) below. The base of the test device is to remain in contact with the sliding surface during the test. a) When a slide bedway is wider than 400 mm (15.75 in), the test shall be performed twice with the base of the test device positioned at both side	P

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	extremities of the slide bedway and slide entry points, as shown in Figure 16. Testing shall be completed in accordance with Clause 12.4.6.1. The distance between the test device and the slide sidewall of the slide shall remain constant through the path of travel. b) The centre post of the test device is not to be placed within 200 mm (7.87 in) of the slide sidewalls. For slides with multiple slide bedways (e.g., dual slides and triple slides), treat each slide bedway as a separate slide. c) When the slide bedway width is less than or equal to 400 mm (15.75 in) or continuously curved (i.e., tube slide, spiral slide, etc.), then the test device shall remain in the centre of the slide bedway. Testing shall be completed in accordance with Clause 12.4.6.1. The distance between the test device and the slide sidewall of the slide shall remain constant through the path of travel. **12.4.6.3 Sliding section entrance** The test device, shown in Figure 17, shall be slowly applied along all surfaces and junctions of the slide enclosure and any junction of the supporting structure that fall within the testing range of the device. The test device (with or without the centre post) shall be held in the corresponding vertical position 200 mm (7.87 in) from the transition point of the sliding section of the slide (where the slope of the sliding surface is greater than 18° from horizontal) and at the appropriate lateral location. The starting point or base point of the 3 mm cord (0.12 in) cannot be extended beyond the height or width of the opening as shown in Figure 17. The testing range for wide and narrow slides as described in Clause 12.4.6.2 shall be adhered to (see Figures 16 and 17). Testing shall be completed in accordance with Clause 12.4.6.1. **12.4.6.4 Protrusions adjacent to slides** Any accessible protrusion that allows the 76.20 mm (3.0 in) protrusion gauge to pass over it shall have no projection extending more than 3 mm (0.12 in) perpendicular from the initial surface. The area that is subject to this requirement shall be as outlined in Figure 18.	
12.4.7	**Sliding poles** The test device (with or without the centre post) (Figure 14) shall be slowly applied along all surfaces and junctions of parts of the platform, deck, barriers, and guardrails and any junction of the sliding pole to the supporting structure of the playstructure within 400 mm (15.75 in) of the entrance/exit to the sliding pole. The application of the test device shall be influenced solely by its own weight. The test	P
12.5	Crush or shear point	P
12.5.1	General There shall be no crush or shear point caused by the 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 (e.g., junctions in pendulum see-saws or glide rides), while the swinging elements are within their normal swinging angles. A crush or shear point is any point that entraps a 15.75 mm (0.62 in) diameter rod in one or more positions.	P
12.5.2	Requirements	P

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	12.5.2.1 To reduce the likelihood of unintentional contact with a crush or shear point, an opening shall comply with either Clause 12.5.2.2 or 12.5.2.3. **12.5.2.2** An opening with a minor dimension of less than 25.4 mm (1.0 in) shall be acceptable if a finger probe (as illustrated in Figure 19), 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 4.45 N (1 lbf). **12.5.2.3** In the case of an opening in an enclosure with a minor dimension of 25.4 mm (1.0 in) or more, the crush or shear point shall be located at the distance specified in Table 1 from the plane of the opening. **Note:** *An enclosure in this case covers a crush or shear point.*	
12.5.3	Exemptions The following shall be exempt from the requirements of Clauses 12.5.1 and 12.5.2: a) chains and their method of attachment; b) the area where heavy-duty coil springs are attached to the body and base of rocking equipment; c) the area between a swinging element and a horizontal top rail; and d) the area between small, lightweight moving parts that are integral parts of the play activity (e.g., abacus beads, bell clappers, or telephone receivers), provided that this area is not considered a crush or shear point as specified in Clause 3.	P
12.6	Suspended hazards	NA
12.6.1	General requirements There shall be no single non-rigid component (e.g., cable, wire, or rope) suspended between play units or from the ground to the play unit within 45° of horizontal, unless the non-rigid component is above 2.1 m (82.68 in) from the protective surfacing or is a minimum nominal dimension of 25 mm (0.98 in). The suspended elements should either be brightly coloured or contrast with surrounding equipment to increase visibility.	NA
12.6.2	Looping **12.6.2.1** Rope, cable, or chain shall be fixed at both ends and shall not be capable of being looped back on itself to create an inside loop perimeter greater than 125 mm (4.92 in). 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 380 mm (15.0 in). Any flexible element (chains; cables; connectors, such as “S” hooks; and so forth) used to suspend the ring or rung shall have a total length no	NA

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	greater than 180 mm (7.1 in). **12.6.2.2** Multiple (two or more) suspended components (e.g., cables, wires, ropes, or similar components) located at two or more elevations may be suspended below 2.1 m (82.68 in) when they comply with all other requirements for single suspended components and cannot be looped or stretched to contact another suspended component(s).	
12.6.3	Exemptions **12.6.3.1** Climbing net structures (see Clause 15.15) shall be exempt from the requirements of Clause 12.6.1. **12.6.3.2** Enclosed swing seats and swing seats designed with removable supports or adjustable elements to hold the user upright or prevent falling out are exempt from Clause 12.6.2. **12.6.3.3** For ground-level components with attached manipulative devices (e.g., ropes, chains, cables, and belting), the length from the attachment point to the end of the manipulative device shall not be longer than 610 mm (24 in) and is exempt from this looping requirement if the attachment point is not higher than 685 mm (27 in) above the underlying surface. **12.6.3.4** Chain or cable used to support a swing or a user on a swing shall be exempt from the requirements of Clauses 12.6.1 and 12.6.2. Fibre rope shall not be used as a method of suspending swings.	NA
12.7	Elevated surfaces An elevated surface shall also be considered as a designated play surface if it meets both of the following conditions: a) A flat surface test device 50 mm (1.97 in) long × 50 mm (1.97 in) wide and constructed of rigid material (see Figure 55) 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. b) The accessible flat surface shall be less than 30° from horizontal.	NA
13	Requirements for access/egress	P
13.1	Stepladders, stairways, and ramps	P
13.1.1	Spacing Steps, not including the first bottom step, shall be evenly spaced within a tolerance of ±6 mm (0.24 in). All steps shall be horizontal within a tolerance of ±2° as shown in Table 2.	P

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13.1.2	Design Steps shall not trap water (i.e., no standing water shall be permitted to accumulate) and shall not encourage the accumulation of debris.	P
13.1.3	Slope The access slope, tread or ramp width, tread depth, and vertical rise shall be as shown in Table 2.	P
13.1.4	Handrails **13.1.4.1** For stairways and ramps, with the exception for spiral stairways noted in Clause 13.2.1.3, at least two continuous handrails shall be provided on each side, except where protective barriers are used. The handrails attached to the side of the stairs or ramps shall be immediately contiguous with the stepping or walking surface. The lower handrail shall be at approximately 350 to 550 mm (13.78 to 21.65 in) above the step tread, and the upper rails shall be at approximately 725 to 950 mm (28.54 to 37.40 in) above the step tread. See Table 2. For stepladders, a single, continuous handrail shall be provided on each side. The handrail shall be immediately adjacent to the stepping or walking surface. For children 18 months to 5 years old, the maximum height of the handrail shall be 725 mm (28.54 in) above the step tread. For children 5 to 12 years old, the maximum height of the handrail shall be 950 mm (37.40 in) above the step tread. See Table 2. **13.1.4.2** Stairways or stepladders that consist of only one tread shall have handrails or alternative means of hand support on both sides. **13.1.4.3** Handrails or other means of hand support shall be available for use at the beginning of the first step. **13.1.4.4** Handrails shall be between 24 and 40 mm (0.94 and 1.57 in) in diameter or maximum cross-section. See Table 2. **13.1.4.5** The handrail height shall be 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.	P
13.2	Other means of access	P
13.2.1	Spiral stairways **13.2.1.1** Spiral stairways shall meet the general requirements for spacing, orientation, drainage, tread width, and vertical rise specified for stairway access in Clauses 13.1.1 to 13.1.3. **13.2.1.2**	NA

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	The depth of the outer edge of the tread on spiral stairways shall be 175 mm (6.89 in) or greater on equipment for children 18 months to 5 years old, and 200 mm (7.87 in) or greater on equipment for children 5 to 12 years old. These depth requirements shall apply to both spiral stairways with open risers and spiral stairways with closed risers. See Table 2. **13.2.1.3** Spiral stairways shall meet the requirements specified for handrails in Clause 13.1.4. 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.	
13.2.2	**Climbers** **13.2.2.1** Arch climbers and flexible components shall not be used as the sole means of access to equipment intended for structures designed for children 18 months to 5 years old. **13.2.2.2** 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 below the level of the protective surfacing. **13.2.2.3** Connections between ropes, cables, chains, or tires used as access to other components of equipment shall be securely fixed. **13.2.2.4** Flexible components used as access to other components of equipment for use by children 18 months to 5 years old shall readily allow users to bring both feet to the same level before ascending to the next level. **13.2.2.5** Climbers used as access to other components shall provide a means of hand support for use while climbing. **13.2.2.6** Rungs that are used for hand support during ascent or descent of climbing apparatus shall be between 24 and 40 mm (0.94 and 1.57 in) in diameter (see Table 2).	NA
13.3	Transition from access to platform **13.3.1** On stairways and stepladders, there shall be a continuation of handrails from the access to the platform. **13.3.2** On accesses that do not have side handrails, such as rung climbers, arch climbers, or flexible components, there shall be alternative handgripping support to facilitate the transition to the platform. **13.3.3** For rung climbers, flexible components, and arch climbers, the stepping surface used for final access shall not be above the designated play surface it serves.	NA
13.4	Platforms, landings, walkways, ramps, stairways, and designated transitional surfaces	P

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13.4.1	General Platform surfaces shall be horizontal within a tolerance of ±2°.	P
13.4.2	Drainage Platforms, landings, walkways, ramps, stairways, and designated transitional surfaces shall not trap water and shall not encourage the accumulation of debris.	P
13.4.3	Guardrails **13.4.3.1** Guardrails shall be provided on platforms, landings, walkways, ramps, stairways, and similar transitional play surfaces in accordance with Clauses 13.4.3.2 to 13.4.3.5. Guardrails are not required to surround the designated play surfaces on play equipment, except as specified elsewhere in Clause 13 or 15. Guardrails shall contain no designated play surfaces. **13.4.3.2** Guardrails or protective barriers (see Clause 13.4.4) shall be provided on elevated surfaces that are greater than 500 mm (19.69 in) above the protective surfacing when intended for use by children 18 months to 5 years old, and on elevated surfaces greater than 750 mm (29.53 in) above the protective surfacing when intended for use by children 5 to 12 years old. See Table 3. **13.4.3.3** Guardrails shall completely surround the elevated surface, except for entrance and exit openings necessary for each event. Means of ascent and descent, except at access points for stairs and ramps, that are accessible by openings in guardrails with horizontal dimensions greater than 375 mm (14.76 in) shall have a minimum of one top rail [i.e., the maximum opening(s) without a top guardrail shall be 375 mm (14.76 in) in the horizontal dimension (see Figure 20)]. At least one point between 525 and 950 mm (20.67 and 37.40 in) above the platform shall be a maximum of 375 mm (14.76 in) in width. **13.4.3.4** The top surface of guardrails shall have a height of 725 mm (28.54 in) or greater when the elevated surface is for use by children 18 months to 5 years old, and 950 mm (37.40 in) or greater when intended for use by children 5 to 12 years old. See Table 3. **13.4.3.5** The lower edge of guardrails on elevated surfaces intended for children 18 months to 5 years old shall be not greater than 575 mm (22.64 in) above the underlying equipment surface. For elevated surfaces intended for children 5 to 12 years old, the lower edge of the guardrails shall be not greater than 700 mm (27.56 in) above the underlying equipment surface. See Table 3.	P
13.4.4	Protective barriers **13.4.4.1** Protective barriers shall be provided on platforms, landings, walkways, ramps, and similar transitional play surfaces in accordance with Clauses 13.4.4.2 to 13.4.4.6. Protective barriers are not required around designated play surfaces,	P

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	except as specified elsewhere in Clauses 13 and 15. Protective barriers shall contain no designated play surfaces and shall be designed to minimize the likelihood of climbing. **13.4.4.2** With the exception of stairways and stepladders, protective barriers shall be installed on elevated surfaces greater than 750 mm (29.53 in) above the protective surfacing when intended for use by children 18 months to 5 years old, and greater than 1.2 m (47.24 in) above the protective surfacing when intended for use by children 5 to 12 years old. **13.4.4.3** Protective barriers shall completely surround the elevated surface, except for entrance and exit openings necessary for use. Means of ascent and descent, except at access points for stairs and ramps, that are accessible by openings in protective barriers with horizontal dimensions greater than 375 mm (14.76 in) shall have a minimum of one top rail [i.e., the maximum opening(s) without a top guardrail shall be 375 mm (14.76 in) in the horizontal dimension]. Portions of the opening may extend beyond a width of 375 mm (14.76 in), provided that the size of the extended space precludes full passage of the torso probe outside the 375 mm (14.76 in) main opening width. At least one point between 525 and 950 mm (20.67 and 37.40 in) above the platform shall be a maximum width of 375 mm (14.76 in) (see Figure 20). **13.4.4.4** The top surface of protective barriers shall have a height of 725 mm (28.54 in) or greater when the elevated surface is for use by children 18 months to 5 years old, and 950 mm (37.40 in) or greater when intended for use by children 5 to 12 years old. **13.4.4.5** Openings within barriers or between the platform surface and the lower edge of protective barriers shall preclude passage of the torso probe (see Clause 12.2.2). **13.4.4.6** On stairways, all steps greater than 1.2 m (47.24 in) above the protective surfacing shall require protective barriers.	
13.4.5	Adjacent platforms **13.4.5.1** Adjacent platforms, between which access is intended, that are intended for use by children 18 months to 5 years old and that have a height difference greater than 300 mm (11.81 in) or adjacent platforms that are intended for use by children 5 to 12 years old and that have a height difference greater than 450 mm (17.72 in) shall have an access component (see Figure 21). **13.4.5.2** Access components between adjacent platforms shall comply with the requirements of Clause 13.3. **13.4.5.3** Guardrails and protective barriers on adjacent platforms shall meet the same requirements that apply to guardrails and protective barriers for other platforms, as specified in Clauses 13.4.3 and 13.4.4. If the area between the platforms does not permit the full barrier height, the guardrails and protective barriers are exempt from Clauses 13.4.3 and 13.4.4, and protective infill shall be used	P

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	instead (see Figure 21). **13.4.5.4** Consideration should be given to guard against inadvertent falls from upper platforms onto lower platforms or over the protective barrier/guardrail on the lower platforms.	
14	Playground layout	P
14.1	Protective surfacing and no-encroachment zones	P
14.1.1	Protective surfacing zone There shall be a protective surfacing zone for each play structure, which shall consist of obstacle-free surfacing that conforms to the requirements of Clause 10 for the defined fall height of the equipment. The dimensions and configuration of the protective surfacing zone shall be dependent on the type of equipment as specified in Clauses 14.2 to 14.10.	P
14.1.2	No-encroachment zone **14.1.2.1** There shall be a no-encroachment zone provided where specified in this Standard. See Clauses 14.4 to 14.6. **14.1.2.2** The no-encroachment zone shall consist of an obstacle-free area. The surface in a no-encroachment zone need not conform to the surfacing requirements of Clause 10. **14.1.2.3** The no-encroachment zone shall extend at least 1.8 m (70.87 in) beyond the protective surfacing zone. **14.1.2.4** Two adjacent pieces of equipment that each require a no-encroachment zone may share a single noencroachment zone, provided that the distance between the respective protective surfacing zones is at least 1.8 m (70.87 in). The no-encroachment zone cannot overlap the protective surfacing zone for stationary or moving equipment unless specifically allowed in other clauses of this Standard.	P
14.1.3	No-encroachment zone (embankment slides) The no-encroachment zone shall conform to the requirements of Clause 14.5.3. The elevation of the slide shall be calculated using Figure 37 b) b).	NA
14.2	Stationary equipment (excluding slides)	P
14.2.1	General **14.2.1.1** Stationary play equipment can be free-standing structures or can be combined with other play equipment (see Figure 22).	P

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	14.2.1.2 The protective surfacing zone for stationary play equipment shall extend to not less than 1.8 m (70.87 in) on all sides of the playstructure. Equipment designed so that a user maintains constant contact with the ground during play has no individual protective surfacing zone requirement (e.g., sandboxes, diggers, free-standing activity walls, free-standing playhouses, and play counters). However, the requirements for placement and circulation under Clause 14.10.1 and surfacing materials under Clause 10.3.1 shall apply. Ramps, platforms, or other stationary bridges, when used to connect an elevated access route from the perimeter of the playground to the play equipment, shall be exempt from the protective zone fall requirements in the area where the connection is made at the perimeter, provided that all other play components are within the protective surfacing zone that complies with Clause 10. **Note:** *If a route that is accessible to persons with disabilities is to be included, refer to Annex H.* **14.2.1.3** The protective surfacing zone for two or more pieces of stationary equipment that are not physically attached but are linked by play function shall be determined as if the separate pieces of equipment were parts of a composite play structure.	
14.2.2	Rocking/springing equipment **14.2.2.1 Rocking/springing equipment intended for sitting** **Note:** *See Figure 23.* The protective surfacing zone for rocking/springing equipment upon which the user is intended to sit shall be not less than 1.8 m (70.87 in) in all directions from the sides of the playstructure. The protective surfacing zone of rocking/springing equipment intended for sitting may overlap the protective surfacing zone of other play equipment. **14.2.2.2 Rocking/springing equipment intended for standing** **Note:** *See Figures 24 and 25.* The protective surfacing zone for rocking/springing equipment upon which the user is intended to stand shall be not less than 2.1 m (82.68 in) in the direction of motion and 1.8 m (70.87 in) in the other directions. The protective surfacing zone of rocking/springing equipment intended for standing may overlap the protective surfacing zone of other play equipment.	NA
14.3	Rotating equipment **Note:** *See Figure 26.* **14.3.1** The protective surfacing zone for equipment with a maximum diameter of less than or equal to 1 m (39.37 in) and an axis of rotation within 45° from vertical shall not be less than 1.8 m (70.87 in) from the perimeter of the playstructure. This protective surfacing zone may overlap another protective surfacing zone, provided that the adjacent protective surfacing zone is permitted to overlap (see Figures 22 and 26).	NA

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	14.3.2 The protective surfacing zone for equipment with a maximum diameter greater than 1 m (39.37 in) and that rotates with an axis of rotation within 45° from vertical shall not be less than 2.7 m (106.30 in) from the perimeter of the playstructure. The outer 0.9 m (35.4 in) of this protective surfacing zone may overlap into a no-encroachment zone or into another protective surfacing zone, provided that the adjacent protective surfacing zone is permitted to overlap (see Figures 22 and 26). **14.3.3** The protective surfacing zone for equipment with an axis of rotation within 45° from horizontal shall not be less than 1.8 m (70.87 in) from the perimeter of the playstructure. Equipment with an axis of rotation within 45° from horizontal may be attached to a composite playstructure. **14.3.4** Free-standing play equipment with an axis of rotation within 45° from horizontal can overlap the protective surfacing zones of other play equipment but not in the direction of motion.	
14.4	Swings	NA
14.4.1	Single axis swings **14.4.1.1** The protective surfacing zone to the front and rear of single axis swings shall be a minimum distance of 2*Y* on a line extending 90° both front and rear from the longitudinal direction of the suspending beam, where *Y* equals the vertical distance from the top of the sitting surface when occupied by the maximum user to the pivot point of the swing. The total horizontal distance from the front to the rear of the protective surfacing zone shall be not less than 4*Y* (see Figure 27). **14.4.1.2** For swings with enclosed swing seats or bucket seats, the protective surfacing zone to the front and to the rear of the swing shall be a minimum distance of 2*Y* on a line extending 90° both front and rear from the longitudinal direction of the suspending beam, where *Y* equals the vertical distance from the top of the sitting surface to the pivot point on the swing. The total horizontal distance from the front to the rear of the protective surfacing zone shall be not less than 4*Y* (see Figure 28). **14.4.1.3** No other play equipment protective surfacing zone shall overlap the sides of the front-to-back protective surfacing zone of a single axis swing. **14.4.1.4** The protective surfacing zones at the sides of the swing structure shall extend in a semicircle not less than 1.8 m (70.87 in), measured from the end of the top beam. Beyond this area, the protective surfacing zone shall be not less than 1.8 m (70.87 in) from a line extending through the centre of the swing seat, where measured perpendicularly to the direction of the motion. The support structure protective surfacing zone for adjacent single axis swings may overlap. **14.4.1.5** A no-encroachment zone of not less than 1.8 m (70.87 in) shall be provided at	NA

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	each end of the direction of motion of the swing, except as otherwise permitted by Clause 14.11.2 (see Figures 27 and 28). **14.4.1.6** The side protective surfacing zone of a support structure for a single axis swing and the protective surfacing zone of other play equipment may overlap. The minimum distance between the outermost parts of the structures shall be 1.8 m (70.87 in).	
14.4.2	Rotating swings **14.4.2.1** The protective surfacing zone for a rotating swing shall be a minimum horizontal distance of 2*Y* in all directions from the swing pivot point, where *Y* equals the vertical distance between the pivot point and the top of the swing seat or suspended member (see Figure 29). **14.4.2.2** The protective surfacing zone surrounding the support structure of a rotating swing shall extend not less than 1.8 m (70.87 in) in all directions from the structure, measured from the end of the top beam [see Figure 29 a)]. **14.4.2.3** The protective surfacing zones and no-encroachment zones of separate adjacent rotating swings may overlap, provided that the swing top beams are configured in a straight line and the distance between the support structures is 1.8 m (70.87 in) [see Figure 29 b)]. **14.4.2.4** A no-encroachment zone of not less than 1.8 m (70.87 in) shall be provided. The protective surfacing zone and no-encroachment zone for a multiple-bay rotating swing shall be evaluated as a single unit; however, the swing bay clearances shall not overlap (see Figure 29).	NA
14.4.3	Combination swings The boundary of the protective surfacing zones and no-encroachment zones for combination swings shall be composed of the individual protective surfacing zones and no-encroachment zones as defined in Clause 14.4.1 or 14.4.2, or both, for the individual suspended elements (see Figure 30). **Note:** *Clause 14.4.3 has been adapted, with permission, from ASTM F1487,* Standard Consumer Safety Performance Specification for Playground Equipment for Public Use*, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.*	NA
14.5	Slides **Note:** *See Figures 31 and 32.* **14.5.1** The protective surfacing zone around the steps or ladder, platform, and slide bed of slides shall meet the protective surfacing zone requirements for stationary play equipment, except as specified in Clause 14.5.2. **14.5.2** The protective surfacing zone at the lower exit end of the slide bed shall extend,	P

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	in the direction of descent, a minimum horizontal distance of 1.8 m (70.87 in). On slides where the vertical distance from the protective surface at the lower exit to the highest point of the sliding surface (dimension *X*) is greater than 1.8 m (70.87 in), the protective surfacing zone at the lower exit of the slide bed shall extend a horizontal distance of *X* mm to a maximum of 2.4 m (94.49 in) in the direction of descent. The width of the protective surfacing zone beyond 1.8 m (70.87 in) in the direction of motion shall be an extension of the slide clearance zone (see Clause 15.6.7). **14.5.3** A no-encroachment zone shall be provided in front of the lower exit protective surfacing zone of a slide, except for slides with a starting platform of 1.2 m (47.24 in) or less in height. The width shall be an extension of the slide clearance zone dimensions (see Clause 15.6.7.1).	
14.6	Embankment slides **Note:** *See Clause 3.* **14.6.1** On an embankment slide, the area from the starting platform and/or sitting section to the end of the exit section is exempt from the protective surfacing zone requirements. **14.6.2** An embankment slide that is elevated above the level of the underlying ground surface shall have no hard surface (e.g., landscape rock, log, retaining barrier, asphalt, or concrete) or sharp object inside the slide clearance zone as defined in Clause 15.6.7. **14.6.3** The exit protective surfacing zone of an embankment slide with a starting elevation less than or equal to 1.5 m [see Figure 37a b)] is exempt from the side protective surfacing zone requirements and only needs a slide exit protective surfacing zone that meets the requirements of Figures 33 b) and c). **14.6.4** The embankment slide shall exit onto a protective surfacing zone that is not part of the embankment. **14.6.5** The protective surfacing at the slide exit shall meet the requirements of Clauses 14.5.2 and 14.5.3. The elevation of the slide shall be calculated using Figure 37 b) b).	NA
14.7	Track rides The protective surfacing zone of a track ride shall extend not less than 1.8 m (70.87 in) in all directions from the equipment (see Figure 34).	NA
14.8	Cable rides The protective surfacing zone for a cable ride shall be provided as shown in Figure 35.	NA
14.9	Composite play structures	NA

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	14.9.1 A composite playstructure shall be considered a single piece of play equipment. The protective surfacing zone for a composite playstructure shall be the same as that required for stationary equipment, except at areas that specifically require a greater distance, such as the exit of slides, as identified in other clauses of this Standard. **14.9.2** Identifying and establishing assembled protective surfacing zone standards for all possible configurations of a composite playstructure is impractical. Therefore, when designing a modular composite playstructure, the professional judgment of play equipment manufacturers, designers, and owners/operators shall be used to eliminate hazards created by conflicts in circulation or use patterns or both.	
14.10	Placement of play structures and equipment **Note:** *When developing the layout for a playground, professional judgment should be used when dealing with such objects as trees, benches, etc.* **14.10.1** Sufficient space and vertical clearance shall be provided between all adjacent structures and individual play equipment. **14.10.2** 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.	NA
14.11	Small-children's fenced playgrounds **14.11.1** In a small-children's fenced playground, if a playhouse or enclosed space has designated play surfaces but, because of the enclosure, a user cannot fall to the surface below in a given direction, then a protective surfacing zone shall not be required in that direction. All other requirements of this Standard shall apply. **14.11.2** In a small-children's fenced playground, if an enclosed single swing seat has a pivot height of 2.4 m (94.49 in) or less above the protective surfacing, a no-encroachment zone shall not be required, and the protective surfacing zones at the sides of the swing shall measure 1.8 m (70.87 in) from the centre of the outermost swing seat in a given side direction.	NA
15	Equipment	P
15.1	General New play components, including modifications, or additional elements, might not specifically fit into the play component types listed in Clause 15. In those instances, the designer or manufacturer, or both, shall, using professional judgement, perform and document a hazard identification and risk/benefit assessment (see examples provided in Annex J) and take necessary actions to minimize the likelihood of serious and/or life-threatening injuries. In addition,	P

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	other clauses in this Standard, where applicable, shall apply.	
15.2	Balance beams **15.2.1** The top surface of balance beams shall be not greater than 300 mm (11.81 in) above the protective surfacing when intended for use by children 18 months to 5 years old, and not greater than 400 mm (15.75 in) above the protective surfacing when intended for use by children 5 to 12 years old. **15.2.2** Support posts for balance beams shall not pose a tripping hazard. **15.2.3** The fall height shall be the distance between the highest part of the walking surface and the protective surfacing below. See Table 4.	NA
15.3	Climbers **15.3.1** Rungs that are used for hand support during ascent and descent of climbing apparatus shall be between 24 and 40 mm (0.94 and 1.57 in) in diameter. **15.3.2** Flexible components (e.g., nets, chains, and tires) of stand-alone climbing structures shall meet the same requirements as those specified in Clause 13.2.2 for flexible components that provide access to or linkage between structures. **15.3.3** The fall height for stand-alone climbing structures shall be the distance between the highest part of the climbing component and the protective surfacing below. See Table 4. **15.3.4** The fall height of climbers used for access to and egress from composite playstructures shall be the distance between the highest part of the climber intended for foot support and the protective surfacing below. See Table 4. **15.3.5** Free-standing arch climbers are not recommended for children 18 months to 5 years old.	NA
15.4	Upper body equipment **15.4.1** The centre-to-centre distance between rungs on upper body equipment with fixed handgrips shall be not greater than 375 mm (14.76 in). **15.4.2** Handgrip devices on upper body equipment shall be between 24 and 40 mm (0.94 and 1.57 in) in diameter. **15.4.3** Rigid handgrips shall not twist or rotate about their own axis. **15.4.4** The horizontal distance from the leading edge of the takeoff and/or landing structure to the first handhold of upper body equipment shall be not greater than 250 mm (9.84 in). In addition, where the takeoff or landing point is provided by	NA

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	means of rungs, the horizontal distance to the first handhold shall be not less than 200 mm (7.87 in) but not greater than 250 mm (9.84 in). **15.4.5** For equipment intended for use by children 18 months to 5 years, the maximum height of the upper devices shall be 1.5 m (59.06 in), measured from the centre of the grasping device to the top of the protective surfacing below. For equipment intended for use by children 5 to 12 years, the maximum height of the upper body devices shall be 2.1 m (82.68 in) measured from the centre of the grasping device to the top of the protective surfacing below. **15.4.6** For equipment intended for use by children 18 months to 5 years, the maximum height of the takeoff/landing structure for upper body equipment shall be not more than 450 mm (17.72 in) above the protective surfacing. For equipment intended for use by children 5 to 12 years, the maximum height of the takeoff/landing structure for upper body equipment shall be not more than 900 mm (35.43 in) above the protective surfacing. **15.4.7** The fall height shall be the distance between the highest part of the equipment and the protective surfacing below. Equipment support posts with no designated play surfaces shall be exempt. See Table 4.	
15.5	Sliding poles **Note:** *See Figure 36.* **15.5.1** Clearance distances from structures to the pole shall be between 450 and 500 mm (17.72 and 19.69 in). **15.5.2** Upper access to the sliding pole shall be from one height only. **15.5.3** The distance from the platform's surface to the top surface of the sliding pole shall be a minimum of 1.5 m (59.06 in). **15.5.4** The pole shall not be greater than 50 mm (1.97 in) in diameter. **15.5.5** The sliding pole shall be continuous, with no protruding welds or joints along the sliding area, and shall have no abrupt changes in direction. **15.5.6** The guardrail or protective barrier at a platform opening to the sliding pole shall comply with Figure 20. **15.5.7** Sliding poles are not recommended for children under five years of age. **15.5.8** Sliding poles not accessed from a platform shall have a fall height of 1.5 m (59.06 in) below the highest portion of the pole to the protective surfacing below. See Table 4.	NA
15.6	Slides	P
15.6.1	General	P

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	15.6.1.1 Slides shall meet the same requirements as all other playground equipment. They may be designed to be used by one user at a time or by several. Slides may provide a straight, wavy, curved, or spiral descent by means of a tube or open slide bed. **15.6.1.2** Slides shall be constructed in a manner that provides a smooth continuous sliding surface, with no gaps or spaces that can create an entanglement hazard, such as the space created between sidewalls when two single slides are combined to create a double-width slide or the point where a hood attaches to the sidewalls of a slide.	
15.6.2	Starting area **15.6.2.1** The starting area shall be a platform of playground equipment, the slide sitting section (see Clause 15.6.3), or a combination of the two. **15.6.2.2** The starting area, when it is a platform of playground equipment, shall meet the requirements for orientation, drainage, guardrails, and protective barriers specified elsewhere in this Standard. The slide starting area, when it is the slide sitting section, shall meet the requirements of Clauses 15.6.3 and 15.6.4. **15.6.2.3** The depth of the starting area on independent slides shall be 550 mm (21.65 in) or greater. For slides on composite structures, the starting area shall be at least 350 mm (13.78 in) in depth. **15.6.2.4** The starting area shall have a width equal to or greater than the width of the sliding section entrance.	P
15.6.3	Sitting section **15.6.3.1** The slide sitting section shall not trap water or encourage the accumulation of debris. **15.6.3.2** The slope of the sitting section shall not exceed 18° from horizontal.	P
15.6.4	Sliding section entrance **15.6.4.1** Handrails or other means of hand support shall be provided at the sliding section entrance to facilitate the transition from standing to sitting. **15.6.4.2** Within the sitting section, there shall be a means to channel the user into a sitting position within 125 mm (4.92 in) before the point at which the slide exceeds 18° from horizontal. **15.6.4.3** If no enclosed sitting section is provided (e.g., a tunnel slide), the slide sidewalls	P

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	shall be designed so that the user's flow of hand movement is unhampered and smooth. **15.6.4.4** The slide sitting section shall have protection to prevent lateral discharge from the beginning of the slide starting area to within 125 mm (4.92 in) before the point at which the slide exceeds 18° from horizontal. The protection to prevent lateral discharge before the start of the means to channel the user into a sitting position shall meet the requirements for guardrails and protective barriers specified elsewhere in this Standard.	
15.6.5	Sliding section **15.6.5.1** The height/length ratio of the slide shall not exceed 0.577 [see Figure 37a a)]. **15.6.5.2** No span of the sliding surface shall have a slope that exceeds 50° from horizontal. **15.6.5.3** The design of the slide bedway shall not allow the child to lose contact with the sliding surface under normal usage (i.e., there shall be no region of zero gravity). **15.6.5.4** A change to the slope of the slide bedway shall have a radius of curvature of at least 750 mm (29.53 in) (see Figure 40). These limits shall not apply to the start of the sliding section. **15.6.5.5** When a slide is intended for use by one child at a time, the slide bedway's inside width shall be 300 mm (11.81 in) or greater for children 18 months to 5 years old, and 400 mm (15.75 in) or greater for children 5 to 12 years old. **15.6.5.6** Slides with flat, open slide bedways shall have sidewalls with a height of 100 mm (3.94 in) or greater that extend along both sides of the slide bedway for the entire length of the sliding surface. **15.6.5.7** Straight slides may have a bedway with a circular, semicircular, or curved section, provided that a) the height of the sidewalls is 100 mm (3.94 in) or greater, measured at right angles above a horizontal line that is 300 mm (11.81 in) long when intended for children 18 months to 5 years old or that is 400 mm (15.75 in) long when intended for children 5 to 12 years old (see Figure 38); and b) the vertical sidewall height of such slides is a minimum of 100 mm (3.94 in) minus two times the width of the bedway divided by the radius of the bedway curvature (see Figure 39). **15.6.5.8** All slides with a curved cross-section (e.g., spiral slides; other slides that change in horizontal direction; and slides with a wide, shallow bedway) shall minimize the likelihood of lateral discharge. **15.6.5.9** The internal diameter of tube slides shall be 575 mm (22.64 in) or greater.	P
15.6.6	Exit section	P

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	15.6.6.1 The exit section shall have a slope between 0° and –10° from horizontal (see Figure 40). **15.6.6.2** The length of the exit section shall be a minimum of 275 mm (10.83 in) (see Figure 40). **Note:** *The exit section should help children maintain their balance and facilitate a smooth transition from sitting to standing when exiting.* **15.6.6.3** The end of the slide shall be rounded to a minimum radius of 10 mm (0.39 in) with no sharp edges. **15.6.6.4** For slides with an elevation not greater than 1.2 m (47.24 in), the end of the slide exit shall be not less than the finished grade and not greater than 275 mm (10.83 in) above the protective surfacing. For slides with an elevation greater than 1.2 m (47.24 in), the end of the slide exit shall be between 175 and 380 mm (6.89 and 14.96 in) above the protective surfacing (see Figure 41).	
15.6.7	Slide clearance zones **15.6.7.1** A clear area (i.e., free of equipment) shall surround the slide bedway. This area is defined by a height of 1.5 m (59.06 in), as measured from the slide bedway surface (portions of slides containing hoods or other devices to channel the user into a seated position, spiral slides, and tube slides are exempted), and a width of 525 mm (20.67 in) beyond the inside face of the sidewalls on each side (see Figure 42). The clear area shall extend through the exit section. **15.6.7.2** Spiral slides with open bedways shall maintain a clear area (e.g., free of equipment) as defined by Figure 43. The clear area shall extend the entire length of the slide and through the end of the exit section. Portions of slides containing hoods or other devices to channel the user into a seated position and enclosed tube slides are exempt.	P
15.6.8	Roller slides **15.6.8.1** In addition to the requirements of Clause 15.6.8, roller slides shall meet the requirements of Clauses 15.6.1 to 15.6.7. **15.6.8.2** There shall be no crush, shear, entrapment, entanglement, or catch points between the junctures caused by two or more components. **15.6.8.3** A crush, shear, entrapment, or catch point shall be any point that admits a 5 mm (0.20 in) diameter rod in one or more positions, either between rollers or between adjacent stationary segments.	NA
15.6.9	Embankment slides **Note:** *See Clause 3 and Figure 33.*	NA

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	15.6.9.1 The platform, sitting section, or slide entry shall a) be 550 mm (21.65 in) in depth and approximately horizontal; b) be at least as wide as the slide bedway; and c) provide a means to channel a user into a sitting position at the entrance to the slide, such as a guardrail, hood, or other device that discourages climbing. **Note:** *See Clause 15.6.4.2.* **15.6.9.2** Embankment slides are exempt from the lateral discharge requirements of Clause 15.6.4.4. **15.6.9.3** The exit section shall comply with Clause 15.6.6. **Note:** *This design eliminates the hazard of falls from elevated heights.* **15.6.9.4** Slide exits of enclosed tube slides shall be designed in a way to discourage snow build-up and/or debris accumulation that could inhibit visibility and block the exit of the slide (e.g., half tube and cut-out). The fall height of an embankment slide in the slide exit protective surfacing zone shall be 1.0 m (39.37 in) from the protective surfacing. See Table 4.	
15.7	Swings **Note:** *Clause 15.7 has been adapted, with permission, from ASTM F1487,* Standard Consumer Safety Performance Specification for Playground Equipment for Public Use*, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.*	NA
15.7.1	Placement **15.7.1.1** Swings shall be located away from other playstructures and circulation areas. See also Clause 14.4. **15.7.1.2** Swings shall not be attached to a composite playstructure.	NA
15.7.2	Support structure The support structure shall be designed to discourage climbing and shall have no designated play surfaces.	NA
15.7.3	Hangers 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.	NA
15.7.4	Suspended elements **15.7.4.1** Suspended elements shall be smoothly finished with blunt or rounded edges and	NA

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	shall conform to Clause 12.3. **15.7.4.2** 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 Clause 15.7.7. Materials subject to loss of impact attenuation shall be addressed by the manufacturer as per maintenance requirements found in Clause 11.2. **15.7.4.3** Any part of a swing that is a minimum of 2.1 m (82.68 in) above the protective surface at its lowest point in use is exempt from the impact requirements. **15.7.4.4** 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. **15.7.4.5** 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.	
15.7.5	Clearances **15.7.5.1 Single axis swings** Single axis swings shall be tested as follows: a) 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. The applied load shall be 55.4 kg (120 lb) with a seated hip breadth of 333 mm (13.1 in) per user. b) The horizontal distance between adjacent suspension elements at rest shall be no less than 600 mm (23.62 in) when measured at 1.5 m (59.06 in) above the protective surface (see Figure 44). c) 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 750 mm (29.53 in) when measured as a vertical clearance maintained downwards from a starting height of 1.5 m (59.06 in) 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 750 mm (29.53 in) minimum clearance is maintained between the suspended element and the support structure when measured 607 mm (24 in) above the top surface of the suspended element (see Figure 44). d) 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: 11.3 kg (24.4 lb) with a seated hip breadth of 170 mm (6.7 in) but shall not be less than 500 mm (19.69 in). e) The vertical distance between the underside of a suspended element and the protective surface shall be no less than 600 mm (23.62 in) for enclosed swing seats, and no less than 300 mm (11.81 in) for all other elements. See Figure 44. **Note:** *Figure 44 has been revised to better clarify the intent of how the clearance*	NA

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	dimensions are to be measured. **15.7.5.2 Multi-axis swings** Multi-axis swings shall be tested as follows: a) Clearance zone — The unobstructed clearance zone required for the suspended element is a cylindrical unobstructed zone centred on the pivot point of the swing with a radius equal to *Y* + 750 mm (29.53 in), whose cylinder length is from the top of the protective surface to the pivot point of the swing with *Y* as shown in Figure 45. b) Under-seat clearance — The vertical distance between the underside of the suspended element and the protective surfacing shall never be less than 300 mm (11.81 in) regardless of occupancy conditions. See Figure 45. **15.7.5.3 Combination swings** Dynamic motion of the suspended element(s) could be influenced by the movement of the frame or other suspended elements (that is, seat), or both. Dynamic motion of the suspended elements shall meet the following criteria when in use: a) Under-seat clearance — The vertical distance between the underside of the suspended element and the protective surfacing zone shall never be less than 300 mm (11.81 in). b) Clearance zone — The suspended element shall not come within 750 mm (29.53 in) of any support structure or other suspended element through its dynamic range of motion during use.	
15.7.6	Fall height The fall height of swings shall be the vertical distance between the pivot point and the protective surfacing. See Table 4 and Figure 45.	NA
15.7.7	Suspended element impact attenuation testing **Note:** *This test is intended to be performed by the manufacturer or test laboratory under controlled conditions.* *Field testing is permitted, provided that it is performed by qualified personnel and all testing criteria for conditions are met.* **15.7.7.1 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. **15.7.7.2 Test apparatus** Test apparatus shall conform to the following: a) Test device — Components as described below, arranged as per Figure 50. b) Test mass — Test mass shall consist of an aluminum sphere or hemisphere with a diameter of 160 ± 5 mm (6.3 ± 0.188 in), mass of 4.6 ± 0.05 kg (10.1 ± 0.1 lb), and surface roughness less than 25 µm (0.001 in) such that the impacting part between the surface struck and the accelerometer is homogeneous and free from voids. c) Accelerometer — The accelerometer shall be mounted at the centre of gravity	NA

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	of the test mass [Clause 15.7.7.2 b)] assembly with the sensitive axis aligned to within 2° of the direction of travel of the test mass, capable of measuring acceleration triaxially. d) Test mass suspension system — Chains, two 6 mm (1/4 in) gauge, of equal length suspended from pivots 610 mm (24 in) apart at the approximate height of the bearings of the suspended element [Clause 15.7.7.2 b)] e) Instrumentation — Specifications for accelerometer, data acquisition, and analysis shall be in accordance with Specification F1292-09, Clause 8.3. **15.7.7.3 Procedure** The test procedure shall be as follows: a) 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 22 ± 3 °C (71.6 ± 37.4 °F). **Note:** *Higher beam heights, using coated chain or stiffer suspension elements, will produce higher impact results.* b) 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. c) Raise the suspended element for test. i) Raise the suspended element along its arc of travel until the suspension element (i.e., chain, cable, etc.) forms an angle of 60° from its at-rest position (see Figure 50). ii) 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 curvature that provides a stable trajectory. iii) Exercise caution to prevent damage to the test equipment. Where there is any possibility of the accelerometer range being exceeded, preliminary tests should 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, trial releases should be made without impacting the test mass. iv) 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 333 mm (13.1 in) across at the attachment points. The mass of the brace should not exceed 10% of the mass of the seat. v) Support and release of the suspended element: Support the element in the raised position through a mechanism that provides release without the application of external forces that would disturb the trajectory of the suspended element. Ensure that the seat and suspending elements are motionless. vi) Release the element so that the assembly travels in a smooth downward arc without any visible oscillations or rotations of the element that would prevent it from striking the test mass at the impact point. d) Collect data: Once satisfactory system operation and calibration are obtained, collect data for 10 impacts. Measure the peak acceleration and HIC for each impact. The time between each impact shall be 1.5 min ± 30 s. e) Calculate the mean value: Calculate the mean value of the peak acceleration and HIC using the data from the 10 tests.	

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15.8	Swinging exercise rings and trapeze bars Swinging exercise rings, trapeze bars, and swinging gates and doors are not recommended for public playgrounds. This recommendation shall not apply to overhead hanging rings, such as those used in a ring trek or ring ladder. These components shall conform to Clause 15.4.	NA
15.9	Vertical rotating equipment	NA
15.9.1	Description Equipment within the scope of Clause 15.9 is used for sitting, standing, or gripping/grasping and rotates with an axis of rotation within 45° from vertical.	NA
15.9.2	Location Equipment shall be installed in a low-traffic area. **Note:** *See Annex F.*	NA
15.9.3	Equipment configuration For equipment greater than 1 m (39.37 in) in maximum diameter, the rotating equipment shall be continuous, and any change in diameter shall be smooth and obvious. No component of the apparatus, including handgrips, shall extend beyond the perimeter of the equipment. See Figure 46.	NA
15.9.4	Handgrips Children shall be provided with a secure means of holding on. Where handgrips are provided, they shall conform to the requirements of Clause 13.1.4.4. Where hand grasps are provided, they shall conform to the requirements of Clause 15.9.9.	NA
15.9.5	Clearance between moving parts **15.9.5.1 Attached to a support structure** Vertical rotating equipment attached to a support structure shall have a clearance zone of 1.8 m (70.87 in), measured from the outermost perimeter of the rotating equipment (see Figure 51). Vertical rotating equipment attached to a support structure with a maximum diameter less than or equal to 1 m (39.37 in) and designed for overhead use shall be exempt from the 1.8 m (70.87 in) clearance zone requirement. **Note:** *A support structure may be part of a composite or free-standing structure.* **15.9.5.2 Crush or shear point** The surface of the platform shall be continuous, and any opening between the axis and the periphery shall conform to the requirements for crush or shear point in Clause 12.5. **15.9.5.3 Vertical clearance**	NA

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	The underside of the platform at the outer perimeter shall allow the passage of the head probe. Platforms with a diameter less than 500 mm (19.69 in) are exempt from this requirement.	
15.9.6	Oscillation Rotating equipment platforms shall not be provided with an oscillatory (up-and-down) motion.	NA
15.9.7	Rotating equipment usage **15.9.7.1** Rotating equipment designed for users 18 months to 5 years old and with a maximum diameter greater than 1 m (39.37 in) shall have a speed-limiting device. Rotating equipment designed for users 18 months to 5 years old with a maximum diameter less than or equal to 1 m (39.37 in) does not require a speed-limiting device. Rotating equipment designed for users 5 to 12 years old does not require a speed-limiting device. **15.9.7.2** When speed limiting is required, rotating equipment shall be constructed to limit its maximum speed to one of the following formulas, as applicable: where *D*l = diameter, m, and *V*l = peripheral velocity, m/s. The *r*/min formula shall be used when *D* is less than 3.2 m (125.98 in), and the velocity formula shall be used when *D* is equal to or greater than 3.2 m (125.98 in).	NA
15.9.8	Fall height The fall height shall be the height above the ground of any part of the perimeter on which a user can sit or stand (i.e., any designated play surface). See Table 4.	NA
15.9.9	Hand grasps The cross-section of any support designed to be grasped shall have a width not exceeding 61 mm (2.40 in).	NA
15.10	See-saws	NA
15.10.1	Fulcrum see-saws Fulcrum see-saws (also known as teeter-totters) are not recommended for children less than five years of age unless they are equipped with a spring centring mechanism to minimize abrupt contact with the underlying protective surfacing.	NA
15.10.2	Shock-absorbing mechanism	NA

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	Shock-absorbing material, such as automobile tires, shall be embedded in the underlying protective surfacing beneath the ends of fulcrum see-saws or secured to the underside of each occupant position. As an alternative, see-saws may be equipped with a spring centring mechanism to minimize the risk of injury due to abrupt contact with the protective surfacing. Such a mechanism shall comply with the general requirements for crush or shear point in Clause 12.5.	
15.10.3	Crush or shear point The fulcrum of the fulcrum see-saws shall comply with the general requirements regarding crush or shear point in Clause 12.5.	NA
15.10.4	Distance between see-saws on one playstructure In structures with more than one see-saw, the distance between each see-saw shall be not less than 1.2 m (47.24 in).	NA
15.10.5	Handgrips **15.10.5.1** Each occupant position shall be provided with handgrips that comply with the general requirements regarding protrusions. Handgrips shall comply with Clause 13.1.4.4. **15.10.5.2** Handgrips shall not turn, rotate, or twist. Those intended to be gripped by one hand shall have a minimum length of 75 mm (2.95 in). Those intended to be gripped by two hands shall have a minimum length of 150 mm (5.91 in). Handgrips shall not protrude beyond the sides of the seat on fulcrum seesaws.	NA
15.10.6	Footrests Fulcrum see-saws shall not be equipped with footrests unless they have a spring centring mechanism to minimize the risk of injury due to abrupt contact with the underlying protective surfacing.	NA
15.10.7	Maximum limits Fulcrum see-saws 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 1.5 m (59.06 in) above the level of the protective surfacing.	NA
15.10.8	Fall height The fall height shall be the maximum height attainable by the see-saw.	NA
15.11	Rocking/springing equipment	NA

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	15.11.1 Seats shall be designed to minimize the likelihood of use by more than the intended number of users. **15.11.2** Each seating position shall be provided with handgrips that comply with the general requirements regarding protrusions (see Clause 12.3) and the requirements for handgripping components (see Clause 13.1.4.4). Handgrips intended to be gripped by one hand shall have a minimum length of 75 mm (2.95 in). Those intended to be gripped by both hands shall have a minimum length of 150 mm (5.91 in). **15.11.3** Footrests having a minimum width of 90 mm (3.54 in) shall be provided and shall conform to the general requirements regarding protrusions (see Clause 12.3). **15.11.4** Spring mechanisms shall conform to the general requirements regarding crush or shear point in Clause 12.5 when the equipment is operated by a maximum user of 54 kg (120 lb). **15.11.5** After installation, the height of the seat, while unloaded and at rest, shall be not less than 350 mm (13.78 in) and not more than 700 mm (27.56 in) above the protective surfacing. **15.11.6** The fall height shall be the maximum height of the seat above the ground. See Table 4.	
15.12	Log rolls **15.12.1** Log rolls are not recommended for children less than five years of age. **15.12.2** Rigid handgripping components shall be provided and shall aid in mounting and dismounting the roll and maintaining balance while in use. **15.12.3** The highest point of the top surface of the roller shall be not more than 450 mm (17.72 in) above the protective surfacing. Handgripping components shall be between 24 and 40 mm (0.94 and 1.57 in) in diameter. **15.12.4** The fall height shall be the height of the highest designated play surface. See Table 4.	NA
15.13	Track rides **15.13.1 General** Track rides are not recommended for children less than five years of age. **15.13.2 Landings** **15.13.2.1** When elevated landings are used, they shall have a minimum depth of 900 mm (35.43 in), as shown in Figure 34. **15.13.2.2** Track rides shall be designed to prevent the structural elements from acting as	NA

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Clause	Test Method & Test Requirement	Rating
	obstructions to the user in the landing area. **15.13.3 Riding zone** **15.13.3.1** An unobstructed riding zone shall be a minimum of 900 mm (35.43 in) on each side of the handgripping component measured from the centre and shall be maintained throughout the length of travel of the handgripping component (see Figure 34). **15.13.3.2** The centre-to-centre distance between adjacent tracks shall be at least 1.2 m (47.24 in). **15.13.4 Handgripping components** **15.13.4.1** The lowest portion of the handgripping component shall be a minimum of 1.6 m (62.99 in) above the protective surfacing. The maximum height of the handgripping component shall not exceed 1.95 m (76.77 in) above the protective surfacing (see Figure 34). **15.13.4.2** When the rolling portions of the handgripping component are enclosed within the track beam, the track assembly shall be exempted from the crush and shear requirements. **15.13.5 Fall height** The fall height shall be the distance from the maximum height of the equipment to the protective surfacing. Equipment support posts with no designated play surfaces shall be exempt. See Table 4.	
15.14	Pulley or cable rides	NA
15.14.1	General These requirements are applicable to cable rides that have a height level difference between the start and finish points and those that are of the same height level at the start and finish points (see Figure 35). Cable rides are not recommended for children less than five years of age.	NA
15.14.2	Fall height The fall height shall be the height of the highest designated play surface. See Table 4.	NA
15.14.3	Distances for cable and handle **Note:** *See Figure 35.* **15.14.3.1** The cable shall be a minimum of 2.1 m (82.68 in) above the ground at any point. See Figure 49. **15.14.3.2** The handle of the pulley shall be a minimum of 1.7 m (66.93 in) above the ground at any point of the ride and not higher than 2.4 m (94.49 in) at any point of the ride. **15.14.3.3** The distance between the handle and the cable shall be a minimum of 375 mm	NA

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Clause	Test Method & Test Requirement	Rating
	(14.76 in) to prevent children from hitting the cable with their heads during the ride. **15.14.3.4** All the measurements in Clauses 15.14.3.1 to 15.14.3.3 are without load (i.e., when the equipment is not in use).	
15.14.4	Speed of pulley **15.14.4.1** The maximum speed of the pulley shall not exceed a running speed of approximately 5 m/s (16.4 ft/s). **15.14.4.2** The speed at the arrival station shall not exceed 2 m/s (6.67 ft/s). **15.14.4.3** The maximum speed and the speed at the arrival station shall be measured with a weight of 150 kg (333.33 lb) (the allowance for two children), without additional force from the outside. **15.14.4.4** To permit the tension of the cable to be adjusted according to the speed of the pulley, an adjustment mechanism not accessible to the public shall be provided.	NA
15.14.5	Arrival and starting stations Structural elements shall be constructed to prevent cable riders from hitting the uprights if they lose their grip on the handle. Such a potential hazard can arise if, through additional force from the outside, the arrival speed exceeds the limits given in Clause 15.14.4.	NA
15.14.6	Stoppers Starting and arrival stations shall be equipped with impact-absorbing stoppers that are able to absorb the energy of an additional pulley speed of 1.5 m/s (4.9 ft/s).	NA
15.14.7	Pulley **15.14.7.1** The pulley shall be designed to prevent it from jumping off the cable. It shall be totally enclosed to prevent any entanglement. **15.14.7.2** The pulley shall be designed to prevent any fraying or damage to the cable. **15.14.7.3** The means of retrieval to the starting point shall pose no danger of injury through impact or strangulation (see Clause 12.4).	NA
15.14.8	Handgrips **15.14.8.1** The handgripping component shall be designed to prevent entrapment (see Clause 12.2).	NA

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	15.14.8.2 The handgripping component shall be designed in accordance with the requirements for handrails presented in Clause 13.1.4.4. **15.14.8.3** Handgrips shall be blunt-edged and shall have a minimum radius of 9 mm (0.35 in), with no sharp points (see Clause 12.3).	
15.14.9	Cable The cable shall be designed to withstand six times the calculated load(s) in accordance with the following formula: $$s = \frac{g}{f_{max}}\left(\frac{Q \times l}{4} + \frac{q \times l^2}{8}\right),$$ where *S*l = calculated load in Newtons (N); *g*l = acceleration due to gravity, 9.81 m/s2; *Q*l = mass of pulley and children [(pulley + 150 kg) (330.69 lb)]; *l*l = total cable length from end to end, m; *q*l = mass of cable, kg/m; and *fmax*l = sag under load, m.	NA
15.15	Climbing net structures	NA
15.15.1	Materials Climbing nets shall be designed to minimize the potential effects of vandalism. When cable-rope elements are used, those that are intended for gripping shall be pliable and textured to facilitate handgripping. The cross-section of any element designed to be gripped shall have, in any direction, when measured across its centre, a dimension of not less than 16 mm (0.63 in) or more than 40 mm (1.57 in).	NA
15.15.2	Connections **15.15.2.1 Connection attachments** All connections shall be secured such that they cannot come loose of their own accord unless specially designed to do so. **15.15.2.2 Looping** All flexible parts shall be secured at both ends and comply with the rope criteria of Clause 12.6.2 (no loops, i.e., they cannot loop to form a noose). **15.15.2.3 Safeguarding connections** Connections shall be safeguarded so that they cannot be undone by unauthorized persons. **15.15.2.4 Foundation connections** Foundation connections shall be designed so that they present no hazards. They shall be located below the full depth of the playground protective surfacing. **15.15.2.5 Hazards**	NA

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	Connections shall present no protrusion hazards (see Clause 12.3.3) and no opportunity for clothing entanglement. **15.15.2.6 Three-dimensional mesh structure** **15.15.2.6.1** The mesh size openings of climbing net structures shall comply with the general provisions for protection against injuries from head and neck entrapments in the unloaded condition (see Clause 12.2). **15.15.2.6.2** The two-dimensional grid or a three-dimensional matrix structure shall be arranged so that there is no clear opening between flexible members with a vertical dimension greater than 1.8 m (70.87 in) and a diameter greater than 508 mm (20 in) for climbing nets (see Figures 48 and 54). **15.15.2.6.3** The fall height for three-dimensional matrix nets shall be the highest distance of either the interior or exterior fall height. Matrix nets with a vertical height greater than or equal to 1.8 m (70.87 in) shall have a minimum fall height of 1.8 m (70.87 in.) The exterior fall height shall be from the highest point attainable within a horizontal distance of 1.1 m (43.31 in) from the edge of the structure where a free fall to the protective surfacing is possible (see Figure 49). This distance is based on the centre-of-gravity height of the maximum user. See Table 4. The interior fall height shall be the distance between the protective surfacing and the highest flexible member, ±30° from horizontal and used as a foot support, where there is a clear vertical path with a diameter of 508 mm (20 in) to the protective surfacing. (See also Figures 52 and 53.)	
15.16	Roofs or shade elements **Note:** *Clause 15.16 has been adapted, with permission, from ASTM F1487,* Standard Consumer Safety Performance Specification for Playground Equipment for Public Use, *copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard can be obtained from ASTM International, www.astm.org.* **15.16.1** Roofs or shade elements that are integral parts of a playstructure are exempt from the requirements of Clause 12, provided that the roof line (i.e., the lowest edge), excluding support members, is at least 2.1 m (82.68 in) above the underlying designated play surface. **15.16.2** Roofs or shade elements that are integral parts of a playstructure that are less than 2.1 m (82.68 in) above the designated play surface shall contain no designated play surfaces. **15.16.3** Support members shall be designed to discourage climbing and have no designated play surfaces. **15.16.4** Roofs or shade elements are exempt from fall height requirements.	NA
15.17	Elevated platforms	NA

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	15.17.1 On elevated platforms where guardrails or protective barriers are required, the fall height shall be measured from the protective surfacing to 725 mm (28.54 in) above the elevated platform when intended for children 18 months to 5 years old and 950 mm (37.40 in) above the elevated platform when intended for children 5 to 12 years old. See Table 4. **15.17.2** The fall height of an elevated platform that is totally enclosed by protective barriers that meet the roof shall be the height of the elevated platform. See Table 4. **15.17.3** The fall height for any slide with a platform elevated more than 300 mm (11.81 in) above the ground and where guardrails or protective barriers are required shall be measured from the protective surfacing to 725 mm (28.54 in) above the elevated platform when intended for children 18 months to 5 years old and 950 mm (37.40 in) above the elevated platform when intended for children 5 to 12 years old, and apply to the entire protective surfacing zone associated with the slide.	
15.18	Drainage All equipment shall be designed to eliminate the potential for trapping water	NA
15.19	**Equipment support posts** Equipment support posts for equipment where the user is no longer in contact with the ground during play shall contain no designated play surfaces.	P
16	Identification and information	NC
16.1	General	NC
16.2	Age-specific equipment	NC
16.3	Labelling	NC
16.3.1	Surface level markers	NC
16.3.2	Warning labels for enclosed swing seats and swing seats designed with additional support assembly	NC
16.3.3	Non-injurious labelling	NC
16.3.4	Placement/location of the label	NC
16.3.5	Attachment	NC
16.3.6	Replacement	NC
16.4	Information	NC

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Clause	Test Method & Test Requirement	Rating
16.4.1	Space	NC
16.4.2	Maintenance instructions	NC
16.5	Records	NC
Annex A (informative) *Advantages of using playground equipment for the children's development*		
Annex B (informative) *Sample maintenance/inspection checklist*		
Annex C (informative) *Suggested injury report form*		
Annex D (informative) *Recommended protective surfacing*		
Annex E (informative) *Annual cost considerations*		
Annex F (informative) *Space requirements for recommended play activities*		
Annex G (informative) *Recommendations for miscellaneous elements near a Playground*		
Annex H (informative) *Children's playgrounds and equipment that are accessible to persons with disabilities*		
Annex I (informative) *A protocol for testing partially bounded openings*		
Annex J (informative) *Hazard identification and risk assessment*		
Annex K (informative) *Thermal comfort*		

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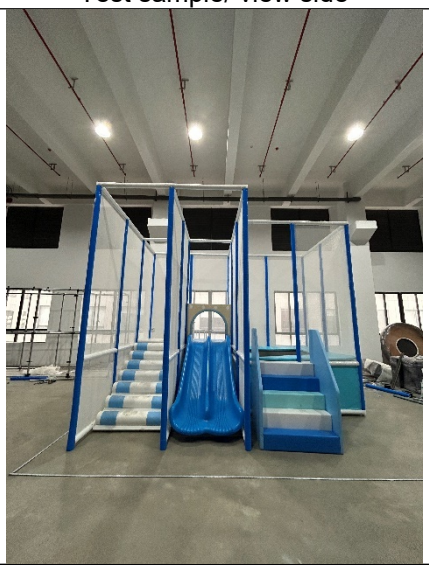	
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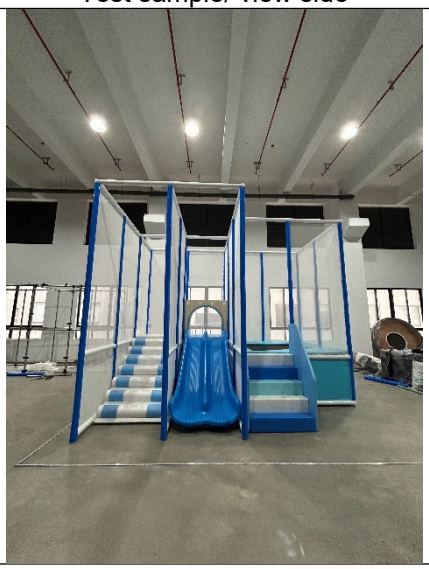	
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	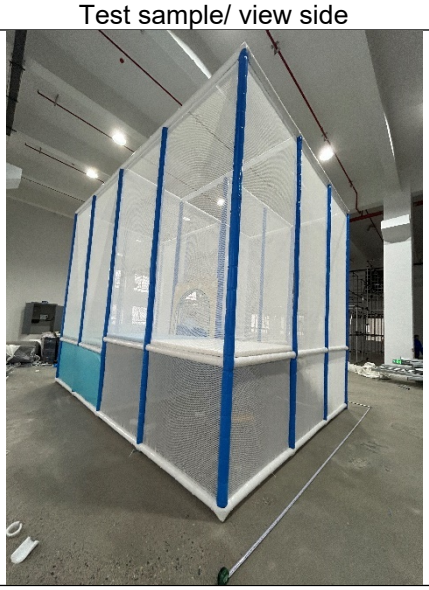

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Result/Rating/Record Key(s)

1. Result/Rating Keys: P = Pass = Meet; F = Fail = Not Meet; NA = Not applicable = Not suitable; NR = NC = Test not conduct/requested per client request; C = Claimed; R = Recorded; D = Data only

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*** End of Report ***

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