Summary of differences between the Australian Standard (AS 4685:2014) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

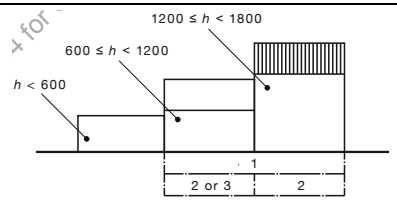
This summary has been prepared by Andrew Reedy as a personal comparison of these Standards and may include some errors or omissions.

AS 4685 – Part 1		EN 1176 – Part 1	
Clause	**Text**	**Clause**	**Text**
1	**Scope** *ZZ Appendix includes the following text at the end of the Scope:* For contained play facilities see AS 3533.4.2.		*Adds the following before 'public playground equipment':* … permanently installed … *New fifth paragraph* It is not applicable to adventure playgrounds with the exception of those items which have been commercially sourced. *Adds to end of clause* The use of electricity in play equipment, either as a play activity or as a motive force, is outside the scope of this standard. The attention of users is drawn to European and local national standards and regulations which are to be complied with when using electricity. Play equipment placed in water and where water can be seen as impact attenuating surfacing is not fully covered by this standard and additional risks are associated with wet environments. The risk of exposure to excessive levels of UV radiation is not covered in this standard.
2	**Normative references** *ZZ Appendix replaces EN 335-2:2006, EN 350-2:1994, EN 351-1:2007 & EN636 with following Standards:* AS 1604, Specification for preservative treatment AS 5604, Timber—Natural durability ratings AS/NZS 3572.22, Plastics—Glass filament reinforced plastics (GRP)— Methods of test Method 22: Method for the determination of hardness by means of a Barcol impressor AS/NZS 4422, Playground surfacing—Specifications, requirements and test method AS/NZS ISO 8124.3, Safety of toys, Part 3: Migration of certain elements (ISO 8124-3:2010, MOD)		
3	**Definitions** *ZZ Appendix adds the following new definitions:* 3.41 supervised early childhood services (SECS) a defined play space used by an education and care service or children's services, for children under school age, which is supervised by educators	3	*Adds the following new definition* 3.4 impact attenuation surfacing Surfacing on impact areas intended to reduce the risk of injury when falling onto it.

	NOTE Educators are early childhood practitioners who work directly with children in education and care services or children's services. 3.42 upper body equipment playground equipment, or part of the equipment, from which suspension is intended using the hand/s without foot support Monkey bars, parallel bars, turning or somersault bars, horizontal ladders, jungle gyms, track rides and other suspended style equipment (excluding fireman's poles, cable ways (flying foxes), rope or chain structures and spatial networks) 3.43 moveable play equipment a range of purpose-made manufactured equipment used in supervised settings (e.g. SECS, schools etc.) that is not permanently fixed in place and can be adjusted and moved by educators on a regular basis to vary play opportunities		*Adds to the end of 3.6 free space* … jumping in bouncing facility for special users (specific requirements are dealt with in the additional parts of EN 1176). *Adds to the end of 3.25 easily accessible* … without further considerations about the use of hands and feet Note 1: Basics skills should control the ability of a child to use a means of access. If the user needs to consider where or how to use their hands and feet when negotiating a means of access the access should generally be considered not easy as it slows down the movement and provides time for intervention. *Adds the following new definitions* 3.32 adequate level of impact attenuation property of a surface having the necessary impact attenuation for a given free height of fall, which is incompliance with: a) Table 4, including sieve test in accordance with EN 933-1; b) EN 1177; c) other appropriate means of verification e.g. value based judgement for turf/topsoil 3.34 forced movement movement of the user caused by the equipment (e.g. swinging, sliding, carousel rotation etc.) which, once started, cannot be totally controlled by the user Note 1 to entry: Falls are not considered forced movement as they are not imposed on the user by the equipment but occur for other reasons. Note 2 to entry: Specific requirements are dealt with in the additional parts of EN 1176. 3.35 bouncing facility playground equipment or equipment parts that due to their flexible characteristics have the main purpose of allowing users to become airborne by jumping without the aid of other user(s) Note 1 to entry: In most cases, the bounce effect can be caused by a spring, rope or flexible suspension bed material. However, some structures that have a minor bouncing effect are not considered as bouncing facilities since their intended main use is not bouncing. Note 2 to entry: Typically, bouncing facilities do not act as trampolines as they do not allow for high jumps or encourage acrobatic jumps, which are more likely to lead to serious injuries or fatalities.

			3.36 suspension bed flexible section of a bouncing facility upon which the user jumps 3.37 one post equipment structurally vulnerable equipment where the failure of one cross-section (either at the foundation or elsewhere in the support post) would be catastrophic Note 1 to entry: This definition includes not only structures with a single support but also those where stability is provided by two legged members or rows of members (see also note to 4.2.14). 3.38 post installation inspection inspection usually undertaken prior to the opening of a playground for public use, intended to assess the equipment and its environment for the overall level of safety on the playground 3.39 fireman's pole vertical or near vertical tube down which users may glide Note 1 to entry: The word 'glide' is used here to help distinguish this type of equipment from slides as defined in EN 1176-3. 3.40 tunnel <playground equipment> continuous enclosed tube-like opening with a length that requires crawling or kneeling to pass through
		4.1.1	**Materials General** *(second paragraph – adds following "equipment")* … or impact attenuated surfacing … *(second paragraph – adds following "equipment")* … or impact attenuated surfacing …
4.1.3	**Timber and associated products** *ZZ Appendix deletes clause 4.1.3 and replaces with the following:* 4.1.3.1 General Timber parts shall be well ventilated and designed such that moisture drains freely away from the timber. Timber treated with copper chrome arsenate (CCA) or creosote preservatives shall not be used. NOTE All preservative treated timber should be installed, finished and		

	maintained in accordance with the supplier's or manufacturer's warranty requirements including supplementary treatment of cut ends, holes, notches etc. 4.1.3.2 Timber in contact with the ground Timber used in contact with the ground shall be either: . a) timber treated in accordance with AS 1604 for Hazard Class H4, (excluding CCA and creosote); or . b) durability Class 1 or 2 in accordance with AS 5604 provided the untreated sapwood does not exceed 15% of the cross-sectional area in which case a) above applies. 4.1.3.3 Timber installed above ground Timber installed above the ground shall be either: a) timber treated in accordance with AS 1604 for Hazard Class H3, (excluding CCA and creosote); or b) durability Class 1 or 2 in accordance with AS 5604 provided the untreated sapwood does not exceed 15% of the cross-sectional area in which case a) above applies. 4.1.3.4 Timber fasteners and connectors All fasteners and connections shall be corrosion protected.		
4.1.5	**Synthetics** *ZZ Appendix adds the following text after the last paragraph:* Synthetic materials shall be resistant to ultraviolet radiation for a minimum of five years from the date of installation and be tested according to local conditions. When tested in accordance with AS/NZS 3572.22, the resin of glass re-enforced plastics (GRP) surfaces shall achieve the Barcol hardness quoted by the manufacturer.	4.1.5	**Synthetics** *(last paragraph – adds following "equipment")* … or impact attenuated surfacing …
		4.1.6	**Dangerous substances** *(first paragraph – adds following "equipment")* … or impact attenuated surfacing … *Replaces note with the following* NOTE Attention is drawn to the provisions of the REACH Regulation (EC) 1907/2006 and its successive modifications. Restricted materials include, but are not limited to, asbestos, lead, formaldehyde, coal tar oils, carbolineums, polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAH compounds).

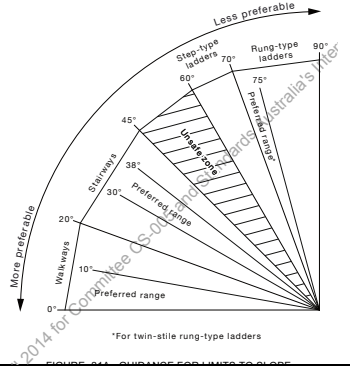
Figure 8	*ZZ Appendix adds new diagram c) as follows:*  c) Equipment for SECS		
4.2.4.1	**Types of protection** *ZZ Appendix adds the following paragraph after the existing text:* For rigid bridges that are easily accessible and on which one or more users can stand without the need of hand support, barriers are required when the height of the standing surface is greater than 1500 mm above the playing surface. When the height of the standing surface is less than 1500 mm, handrails or guardrails are acceptable in lieu of a barrier.	4.2.4.1	*Changes clause name from "types of protection" to "general"* *Adds the following paragraph at the start of the clause:* Different types of protection against falling from elevated platforms are required. The type of protection required will depend on the free height of fall and on the type of equipment, whether it is easily accessible or not (see 4.2.4.3 and 4.2.4.4). See Figure 8 and Annex F.
4.2.4.2	**Handrails** *ZZ Appendix deletes Clause 4.2.4.2 and replaces with the following:* Single handrails shall be not less than 600 mm and not more than 900 mm above the foot position (see Figure 9) unless designed for SECS, in which case single handrails shall be not less than 450 mm and not more than 700 mm above the foot position. This requirement does not preclude the use of two or more handrails provided the upper handrail meets the above requirement and the spacing meets the requirements for entrapment (see Clause 4.2.7). As a minimum, handrails shall conform to the requirements for grasp, see Clause 4.2.4.7.		
4.2.4.3	**Guardrails** *ZZ Appendix deletes the first paragraph and replaces with the following:* For equipment that is not easily accessible, guardrails or barriers shall be provided when the platform is 1 000 mm to 2 000 mm above the playing surface. The height to the top of the guardrail shall be not less than 600 mm and not more than 850 mm measured from the surface of the platform, stair or ramp. For SECS equipment, guardrails or barriers shall be provided when the platform is 600 mm to 1 200 mm above the playing surface. The height to the top of the guardrail shall be not less than 600 mm and not more than 700 mm measured from the standing surface of the platform, stair or ramp.	4.2.4.3	**Guardrails** *Adds the following after 'clear opening of 500mm' in the second paragraph:* …when measured horizontally at a position, with a height between 600 mm to 850 mm from the platform.
4.2.4.3	**Guardrails** *Second paragraph, ZZ Appendix deletes '500 mm' and replaces with '800 mm'.* *ZZ Appendix adds the following note at the end of the clause.* NOTE The opening should have hand supports that comply with 4.2.4.6 or 4.2.4.7		

4.2.4.4	**Barriers** *First paragraph, ZZ Appendix deletes '500 mm' and replacse with '800 mm'.*	4.2.4.4	**Barriers** *Adds the following after ' 500mm amximum' in the second paragraph:* …when measured horizontally at any point
Figure 10	*Figure 10 a) and b), ZZ Appendix deletes dimension '500 mm' and replaces with '800 mm'.*	Figure 10	*Adds descriptions to each image in the figure.* a) And narrow element b) Steep play element is at least as wide as the opening c) Steep play element is wider than the opening
		4.2.4.6	**Grip Requirements** *Adds the following after "designed to be gripped":* … for support of full body weight …
4.2.5	**Finish of equipment** *ZZ Appendix adds the following to the end of the last paragraph:* … Platforms on track rides are the exception and these shall have a radius of no less than 25 mm on the leading edge, or shall have impact attenuating properties that do not introduce a trip hazard.		
		4.2.7.1	**Protection against entrapment – General** *Adds the following at the end of the last paragraph:* … taking into consideration the following conditions (4.2.7.2).
		4.2.7.2 a)	**Completely bound openings** *Adds the following note:* NOTE 1 Probe C represents a 'feet first' passage to an opening and probe E represents a 'head first' passage.
		4.2.7.4 & Table 1	**Entrapment of the whole body** *Adds the following to the start of the past paragraph, & this dimension to Table 1:* Tunnels shall have a maximum length of 10 000 mm …
		4.2.7.5	**Entrapment of the foot or leg** *Reduces the angle from which this requirement applies from 45° to 38°.*
		4.2.7.6	**Entrapment of fingers** *Adds the following notes:* NOTE 2 Only to be used where there is a potential fall to an impact area below. See also adjacent platforms (4.2.8.5.4). NOTE 3 The test process D.4.2 for finger entrapment will only be conducted with the presence of free space and/or falling space.

4.2.8.1	**Determination of free height of fall** *ZZ Appendix adds the following text after the last dash point of the Note:* These examples should not be construed to mean that everywhere to which access may be gained should be deemed as accessible. Consideration should be given to the ease of access and whether or not the configuration actually encourages access to a higher point on the equipment. *At the end of Clause 4.2.8.1, ZZ Appendix adds the following paragraph:* The free height of fall for upper body equipment shall not exceed 2200 mm. The free height of fall for SECS shall not exceed 1800 mm.		
		Table 2	**Free height of fall for different types of use** *Deletes the first line in the table relating to "climbing":* maximum foot support: 3 m to the surface below *Adds a new category to the table – "Bouncing".* Adds the following to the note, following 'climbing' + examples: … or hanging …
		Figure 14	**Examples showing free height of fall** *Adds another figure showing a form of climbing*
Figure 17	**Extent of the impact area** *ZZ Appendix adds the following to the legend:* If $0 \leq Y < 0.6$ then $X \leq 1.5$ m Could be deleted.	Figure 17	**Extent of the impact area** *Changes the first dimension 'If $0.6 \leq Y \leq 1.5$ then $X = 1.5$ m' to:* If $0 \leq Y \leq 1.5$ then $X = 1.5$ m
4.2.8.2.5	**Extent of the falling space** *ZZ Appendix adds the following text at the end of the first paragraph:* For falls less than 600 mm from non-moving equipment the impact area may be less than 1.5 m. NOTE: This is to allow for play elements such as dry creek beds and stepping stones. Could be deleted.	4.2.8.2.5	**Extent of the falling space** *Adds the following text at the end of the first paragraph:* … Where two items with different fall heights are sited together the larger of the two impact areas will take precedence.
		Figure 19	**Example of falling space and free space of a fireman's pole** *Adds the following items to the key:* 1 space occupied by the equipment a fireman's pole minimum clearance (see 4.2.8.3) b free space radius

		4.2.8.3	**Protection against injuries in the free space for users undergoing movement that is forced by the equipment** *Adds the following to the end of the first paragraph:* … of two different pieces of equipment.
4.2.8.5.2	**Equipment with a free height of fall greater than 600 mm or with forced movement** *ZZ Appendix deletes the third paragraph ("Examples of commonly used …") and replaces with the following:* AS/NZS 4422 shall be used as the method of test for the determination of the critical fall height. *After the fourth paragraph 9 "The extent of the impact area …"), ZZ Appendix adds the following text:* Moveable play equipment that measures 600 mm or less from ground level with forced movement shall be exempt from the requirements of this Clause. *ZZ Appendix deletes Note 2 and renumber Note 3 to Note 2 and Note 4 to Note 3.*	4.2.8.5.2	**Equipment with a free height of fall greater than 600 mm or with forced movement** *Changes 'critical fall height' in the third paragraph, first sentence to the following:* … maximum free heights of fall … *Changes the last sentence in the third paragraph to:* Where the installed surfacing can be verified as being in accordance with Table 4, no additional testing is required.
Table 4	*ZZ Appendix deletes Table 4.*	Table 4	**Examples of commonly used impact attenuating materials …** *Includes the following statement under materials:* Where the installed surfacing is verified (e.g. sieve test) as being in accordance with this table or carries a test report according to EN 1177, no additional testing is required.
4.2.8.5.3	**Equipment with a free height of fall not exceeding 600 mm and without forced movement** *ZZ Appendix deletes existing text and replaces with the following:* For playground equipment with a free height of fall not exceeding 600 mm and which does not cause forced movement on the body of the user, it is not necessary to provide an impact attenuating surface beneath or surrounding that equipment item.		
4.2.9.2	**Stairs** *ZZ Appendix deletes the second paragraph and replaces with the following:* For stairs leading to platforms up to 1.2 m in height a guardrail or a handrail may replace the barrier.	4.2.9.2	**Stairs** *Adds the following to the start of the first paragraph:* Stairs with a free height of fall greater than 600 mm … *Deletes the following sentence in the last paragraph:* The line of the stairs shall not be continuous, but shall be offset by at least the width of the set of stairs, or shall change direction by at least 90°.

		Figure 21	**Parts of a stair** *New figure added.*
4.2.9.3	**Ramps** *ZZ Appendix deletes the third paragraph and replaces with the following:* For ramps leading to platforms up to 1.2 m in height a guardrail or a handrail may replace the barrier. Guardrails shall be provided from the leading edge of the ramp.		
4.2.9.4	**Steep play elements** *ZZ Appendix deletes the first paragraph and replaces with the following:* For steep play elements provided on easily accessible parts of the equipment the opening in the barrier shall be no greater than 800 mm and the free height of fall of the platform shall be no greater than 2 000 mm, and 1 800 mm for SECS.	4.2.9.4	**Steep play elements** *Adds the following paragraph at the end of the clause:* Openings leading from a platform with a free height of fall of > 1 000 mm to a steep play element shall have hand supports that comply with grasp requirements.
4.2.9.5	**Easily accessible playground equipment** *At the end of the clause, ZZ Appendix adds the following text:* Figure 21A provides guidance for limits of slope for various means of access.	4.2.9.5	**Easily accessible playground equipment** *Replaces the entire clause with the following:* Equipment designed to allow users to move quickly and freely onto it is to be considered as easily accessible. It is not the intention of this standard to give a definitive list of the types of possible access and associated requirements, but to provide guidance on the best way to tackle the issue of easy access. The following is an example of the hierarchy of three easy access possibilities: a) Ramps starting from the ground are the easiest means of access to the equipment. b) Stairs are the next easiest means of access to the equipment. c) Ladders are the least easy means of access to equipment in this example. There are many designs which can delay access to the equipment, thus giving more time for carers to intervene as appropriate. Such design features may include, but are not restricted to, movement, height or dimensional requirements e.g. reach distance or step height. NOTE 1 Carers include adults, responsible siblings and others who are looking after the user (see CEN/CLC Guide 14 for more information on carers). NOTE 2 Examples of access restriction by height or dimension might include but are not limited to ramps where the start is more than 600 mm above the ground or ladders where the lowest rung is more than 400 mm above the ground. The figure of 400 mm is a compromise between the need to limit access and the need to provide a safe means of exit by the same route.

Figure 21A	*At the end of the clause 4.2.9.5, ZZ Appendix adds the following figure:*  2014 for Committee CS-001 and Standards Australia's Inter		
		4.2.11	**Consumable components** *Deletes the first paragraph.*
		4.2.12	**Ropes fixed at both ends (climbing ropes)** *Adds the following to the end of the first paragraph:* … nor probe E (see Figure D.1) pass through.
		4.2.12.4	**Sheathed wire ropes** *Deletes the following words from the end of the first paragraph:* … or split yarns.
4.2.12.5	**Fibre ropes (textile type)** *ZZ Appendix deletes the third paragraph, which begins with 'Monofilament plastic ropes...'.*		
		4.2.13	Chains *Replaces the entire clause with the following:* Chains for playground equipment shall conform to the dimensional requirements in EN 818-2:1996+A1:2008, Table 2 or EN 818-3:1999+A1:2008, Table 2 as a minimum and, when tested in accordance with D.5, shall conform to one of the following requirements: a) the 8,6 mm rod (see Figure D.13) shall not pass through the minimum cross-section of the chain opening, NOTE When "8-mm-short-link-chains" wear, the openings can increase. If the opening on a worn chain is greater than 8,6 mm, a risk assessment can be carried out to confirm whether replacement is necessary. or where a connection is made b) if the 8,6 mm finger rod passes through the opening, the 12 mm rod (see Figure D.13) shall also pass through the opening.

		4.2.14	Foundations *Adds to the end of the 3rd paragraph and a new paragraph:* Foundations of one post equipment shall be accessible for periodic inspection. The choice and installation of impact attenuating surfacing should be carefully planned in order to allow for inspections and if access to the foundations is required. For example, for synthetic surfacing, this may require the surfacing to be cut-back and re-laid.
		4.2.15	**Heavy suspended beams** *Changes the range of movement in the fifth paragraph from 100mm to 300mm.*
		4.2.16	**Bouncing facilities** *Adds new clause relating to 'Bouncing facilities'.*
4.2.17	*ZZ Appendix adds new Clause 4.2.16 as follows:* **Free height of fall, impact area and handrail, guardrail and barriers requirements for moveable play equipment** Educators should apply a risk assessment approach to the setting up of moveable play equipment suitable to the ages and developmental stages of the children utilizing the moveable play equipment. The free height of fall for moveable play equipment shall not exceed 1500 mm. A minimum impact area of 1500 mm covered/filled with a playground impact attenuating surfacing that meets Clause 4.2.8.5.2 shall apply for moveable play equipment items that measure more than 600 mm from ground level. Moveable play equipment items do not require handrails, guardrails or barriers. The other clauses of this Standard apply to moveable play equipment.		
		5	**Verification of compliance and test reports** *Changes the clause heading from 'Test methods and reports'.*
		5.2	*Adds new clause as follows:* **Confirming the adequate level of impact attenuation after installation of impact attenuating surfacing** As there are significant regional variations in the provision and management of impact attenuating surfacing, it is recommended that requirements are given at a national level. If no requirements are given at national level, Annex H shall be used as it gives requirements to confirm the adequate level of impact attenuation after installation of the impact attenuating surfacing. NOTE This is to ensure that if Annex H is not followed, national requirements are given.

		6.1.2	**Pre-information** *The following point is added to the list of requirements:* d) details of the foundations and any specific provisions for their accessibility during inspection and maintenance;
		6.1.3	**Installation information** *The following point is added to the list of requirements:* i) details of the foundations and any specific provisions for their accessibility during inspection and maintenance;
		6.2.1	**Pre-information for impact attenuating surfaces** *Replaces the existing clause with the following:* 6.2.1 Pre-information for impact attenuating surfacing The manufacturer/supplier shall provide the following information concerning the performance of the impact attenuating surfacing prior to the acceptance of the order (does not apply to turf/topsoil): a) where particulate materials that are included in Table 4 are specified, clear information about the type of material (see Table 4) and the depth of the layer to be used shall be provided, or, if not included in Table 4, the critical fall height of the surfacing as tested in accordance with EN 1177, together with copies of test reports or certificates; b) outline of the installation procedure, climatic limitations on installation and other precautions required; c) procedures to be followed for the operation, inspection and maintenance of the surfacing; d) factors that could affect the properties of the impact attenuating surfacing in service; e) period for which the adequate level of impact attenuation is expected with adequate maintenance; f) how the material allows for routine inspection of equipment foundations, particularly where one post equipment is to be surrounded by wet pour/poured-in place material; g) whether the material is intended for indoor or outdoor use, or both; h) availability of spare parts (if any) and methods to be used for the repair of localized areas of damage; i) compliance of impact attenuating surfacing materials with 4.1 (namely 4.1.6), if applicable; j) a note drawing the operator's attention to the need to increase the frequency of inspection/maintenance if the impact attenuating surfacing is subject to heavy use and/or any conditions that could reduce the impact attenuation (e.g. degradation of organic materials or vandalism as well as influence of ageing due to UV exposure); k) a warning to take care, in relation to specific hazards to children, during incomplete installation or during maintenance.

		6.2.2	**Installation information for impact attenuating surfaces** *Replaces the existing clause with the following:* The manufacturer/supplier of playground surfacing shall provide full and detailed installation instructions in the appropriate language(s) of the country in which the surfacing is to be installed and used. These instructions shall conform to the following: a) instructions shall be printed legibly and in a simple form; b) illustrations shall be used wherever possible; and c) instructions shall include at least the following information: 1) complete procedure for the preparation of the ground, substrate, drainage, etc.; 2) assembly and installation details for the surfacing and equipment required to ensure that the adequate level of impact attenuation is provided; 3) how to deal with edges, perimeters and junctions with other materials, if necessary; 4) any weather limitations during the installation and any subsequent weather protection required; 5) specific instructions if a particular landscape profile is necessary for safe installation and performance; 6) conditions to meet impact attenuation surfacing needs according to the free height of fall of the equipment. The manufacturer/supplier shall supply the details necessary for inspection of the playground impact attenuating surfacing prior to its first use.
		6.2.3	**Inspection and maintenance information for impact attenuating surfaces** *Replaces the existing clause with the following:* NOTE Attention is drawn to EN 1176–7. 6.2.3.1 The manufacturer/supplier of playground surfacing shall provide instructions for maintenance and inspection procedures, e.g. removal of contaminants, with a statement that the frequency of inspection will vary with the type of impact attenuating surfacing material used and its surroundings, e.g. access/exit areas, and other factors, e.g. heavy use, levels of vandalism, coastal location, air pollution, ageing of material. NOTE Lack of maintenance can reduce the impact attenuation properties. 6.2.3.2 Maintenance instructions shall provide all information necessary for retaining the required performance (e.g. minimum depth of particulate impact attenuating surfacing) and, when appropriate, repair or refill of the impact attenuating surfacing. For all types of impact attenuating surfacing particular attention shall be given to the effects of ageing (exposure to UV, heat, cold), pollution, causing degradation or the loss of impact attenuating properties. The instructions shall also specify the following:

			a) that replacement parts shall conform to manufacturer's specifications; b) if special disposal treatment is required for the material or parts; c) the identification of spare parts (connectors, slabs, …); d) any additional measures to be taken, specifically methods of cleaning, disinfecting, repairing etc.; e) the need to keep drainage system functioning; f) that surfacing shall be maintained: in particular, the depth of loose fill materials. NOTE The annual main inspection may require excavation and access to foundations and subsequent repair of the impact attenuating surfacing.
7.1	**Equipment identification** *ZZ Appendix deletes Clause 7.1 and replaces with the following:* The equipment shall be marked legibly, permanently and in a position visible from ground level with at least the following: . a) Name, address and ABN of the manufacturer, importer or supplier. . b) Equipment reference and year of manufacture. c) The designation (number and date) of this Australian Standard, i.e. AS 4685.1:2014, and any other applicable part of the AS 4685 series. The use of the word “permanently” above conveys that the life of the equipment and the environment in which it is likely to be installed shall be taken into consideration. NOTE Manufacturers making a statement of compliance with this Standard on the equipment, packaging, within contractual documentation, internet, or promotional material related to that product are advised to ensure that compliance is capable of being verified.		.
		A.1.1	**Permanent loads – General** *Adds the following to the start of the clause:* Loads “Q” (in Newtons) on equipment and equipment elements are created by the gravity (g) of masses (Q = G Å~ g; masses “G” in kg) as well as by dynamic effects of these masses (e.g. from swings), but also from connected elements (e.g. ropes, chains) and from external influences (e.g. wind). The calculation of the total loads (forces “F” and “T” in Newtons) and their combination, acting on different examples of equipment, is described in the following clauses. For static analysis (stress-calculations) in load bearing parts of equipment the safety factors for the loads as given in B.2 shall be used.

		A.2.2	**User Loads** *Adds the following notes:* NOTE 1 The mass of children up to 14 years is based on the anthropometric data of age group 13,5 to 14,5 years, including 2 kg for clothing. For the other age groups, the mass includes 0,5 kg, 1 kg and 1,5 kg for clothing for 4, 8 and 12 years respectively. NOTE 2 Calculated examples are given in Table A.1 for information.
Figure B.1	*ZZ Appendix deletes '388' and replace with '350'. (The diagram shows the dimension as internal width, whereas the legend indicates the internal width is 350 and the external width as 388.)*		
		D.3.2.1	**Slides** *Adds the following sentence at the end of the first paragraph.* For slides of width greater than 400 mm the test shall be carried out twice with the base positioned at both width extremities of the slide bedway as shown in Figure D.8.
		D.4.2	**Procedure (finger entrapment)** *Changes the last part of the sentence in the ast paragraph to:* … no access shall be given to another finger entrapment site located at less than 100 mm. See Figure D.12.
		D.4.2	**Procedure (finger entrapment)** *Adds several new diagrams (Figures D.11 & D.12) providing clearer guidance on the use of the finger probes.*
		D.5	**Chain openings** *New clause providing apparatus (D.5.1), procedure (D.5.2) and test rods (Figure D.13) for testing the openings in chains.*
		D.6	**Mesuring rebound effect of a bouncing facility** *New clause providing the procedure and (including figure D.14) for testing bouncing facilities.*
		Annex F	**Ilustrations of calculation of free heightof fall (FHF)** *Adds a series of diagrams detailing the maximum free height of fall; body support position; approximate centre of gravity; and the free height of fall for which an adequate level of impact attenuation is required, for each type of playground equipment.*

		Annex G	**Illustration of sand sieve test** *New clause providing a figure (Figure G.1) and a table (Table G.1) relating to sand grain size testing.*
		Annex H	**Procedures for confirming the adequate level of impact attenuation after installation of impact attenauting surfacing** *New cause detailing the requirements for impct testing of surfaces following installation.*

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AS 4685 – Part 2		**EN 1176 – Part 2**	
Clause	**Text**	**Clause**	**Text**
		3.1	**Swing** *Adds the following to the end of the sentence:* … where the pivot or universal joint is more than 1,3 m above the ground
		Figure 1	**Examples of a swing with one rotational axis** *Adds image of a basket swing.*
		3.3	**Swing with several rotational axes (Type 2)** *Adds the following to the end of the sentence:* … in as horizontal position as practicable.
		3.9	**Ground clearance** *Deletes the last part of the sentence – "…when the seat is at rest" and adds the following:* Note: The measurement depends on the seat type, see 4.2.
		3.13	*Adds new definition:* **Group swing seat** seat with a large surface area intended for several users, typically nest or basket swing seats, single point swing seats, tyre seats, and swinging beds
3.14	*ZZ Appendix adds the following new definition:* **Circulation area** the area around the equipment that allows movement from, between and around equipment, and is free of all obstacles that children could run into, trip on or fall on top of and thus be injured. The circulation area includes the fall zones of the equipment and extends to at least the width of the equipment		
4.2	**Ground clearance** *ZZ Appendix adds the text at the end of the first sentence.* … except for SECS, where the minimum ground clearance shall be 300 mm		**Ground clearance** *Changes reference to 'tyre seats' to 'group swing seats' and adds the following measuring criteria.* For group swing seats with a flexible lower part the ground clearance shall be a minimum of 400 mm measured from the underside of the rigid part of the seat in its most onerous position (see Figure 7). *Adds diagram (Figure 7 – Ground Clearance) depicting the means of measuring ground clearance on a group swing seat.*

		4.3	**Seat clearance for single point swing (Type 3)** *Adds the following note:* NOTE The design of Type 3 swings permits a deviation from the free space requirement in EN 1176–1 because the hazard of colliding with the beam is readily foreseeable and the benefit to children of playing on swings of this type is high. For a fuller explanation of risk and benefit see EN 1176-1:2017, Introduction and Scope.
		4.4.1	**Minimum space between the seats of swings** *Adds the following paragraphs:* For group swing seats, the minimum horizontal dimension, C, between the side (see Figure 8a) of a swing seat and the adjacent structure in the rest position shall be: ≥ 20 % length of the suspension member (+400 mm). A swing bay containing one group swing seat shall not contain any other seats. The width of flexible seats such as belt seats where the width is reduced when in use, should be measured with the support points G held 400 mm apart (see Figure 8b).
		4.4.2	**Lateral stability of swing seats** *Adds 'group swing seats to the requirement to increase the distance between suspension members.*
4.6.1	**Swing seats and vertical tyre seats** *After the first sentence, ZZ Appendix adds the following new sentence:* Flexible strap seats and toddler seats constructed of SBR rubber or equivalent do not require testing.		
		4.6.3	**Group swing seats** *Adds the following paragraph after the first paragraph:* For group swing seats that are not round and are wider than 900 mm at their widest point, when tested in accordance with Annex B there shall be no peak values of acceleration greater than 120 g and the average surface compression shall not exceed 90 N/cm2. *Adds the following paragraph at the end of the clause:* When group swing seats are suspended from a Type 1 swing there shall be a secondary means of supporting the swing seat to prevent collapses if the primary joint between the cables or chains and the supporting structure collapse.

		4.10.1	**Free height of fall** *Adds the following paragraph at the end of the clause:* For group swing seats which have a basket shape the free height of fall shall be measured from the top of the supporting frame (see Figure 10).
4.10.2.1	**Dimensions of falling space and impact area** *ZZ Appendix adds the following text after the third paragraph:* For supervised early childhood services (SECS) the impact area for loose fill impact attenuating surface materials length C may be reduced to 1.75m commensurate with the lower free height of fall for SECS settings.		
		Figure 10	**Free height of fall and surfacing requirements beneath a swing** *Adds two additional diagrams depicting the requirements for group swings.*
		Annex A	**Recommendations for design and siting of swings** *Adds the following to the end of the clause:* [fences] …and subject to risk assessment, 1,5 m from the edge of the impact area (measured 0,867 Å~ L + 1,75 m) in the direction of the swinging motion. NOTE Fences are not generally the best solution for providing segregation of swings. However, where they are used it is advised to assess the clearance space in the direction of swinging on an individual basis, depending on the environment, swing type and swing seat type. The risk of miss use will be greatest with big swings, with open seats and least with small swings, with cradle/toddler seats. A smaller clearance in the swinging direction could be accepted where the risks are not viewed as sufficient.

Summary of differences between the Australian Standard (AS 4685:2014) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

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AS 4685 – Part 3		EN 1176 – Part 3	
Clause	**Text**	**Clause**	**Text**
4.2	**Access** *Third paragraph, ZZ Appendix deletes the following text:* and Table 1.		
4.4.3	**Sides and profile of the slide** *ZZ Appendix deletes first paragraph and replaces with the following:* The sliding section shall have solid lateral protection of height (p) (see Figure 5a and 5b) of a minimum of 100 mm, except where the free height of fall is less than 1 000 mm, where the lateral protection may be reduced to a minimum of 50 mm.		
Table 1	*Delete Table 1.*		
4.5	**Run-out section** *ZZ Appendix deletes the last paragraph and replaces with the following:* The end of the type 1 slide run-outs shall turn down into the ground with a radius of at least 50 mm or an angle of at least 90°.		
Figure 7	*ZZ Appendix deletes '100°min.' and replaces with '90°min.'.*		
4.7	**Free space** *ZZ Appendix deletes second paragraph and replaces with the following:* Supporting posts on spiral slides may be used in the free space.		
4.9.1	**Tunnel & mixed slide – Clearance** *ZZ Appendix adds the following to the existing paragraph:* The following alternative requirement, taken from Clause 2.9.1 of AS 4685.3—2004, may be used, for a period of 5 years from the publication of this Standard: Enclosed sections of tunnel slides shall have a minimum internal height of 585 mm and a minimum internal width of 585 mm, when measured perpendicular to the sliding surface.		
4.9.2	**Tunnel & mixed slide – Position** *ZZ Appendix deletes first paragraph and replaces with the following:* Tunnel sections shall start at least at the end of the starting section and may extend into the run-out section.		

Summary of differences between the Australian Standard (AS 4685:2014) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

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AS 4685 – Part 4		**EN 1176 – Part 4**	
Clause	**Text**	**Clause**	**Text**
4.14	**Falling space and impact area** *ZZ Appendix deletes the last two sentences within the first paragraph and replaces with the following:* When tested in accordance with AS/NZS 4422 the impact area around the cableway shall correspond to a critical fall height greater than 1250 mm. NOTE A maximum velocity of 7 m/s is equivalent to a fall height of 2500 mm.		

Summary of differences between the Australian Standard (AS 4685:2014) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

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AS 4685 – Part 5		**EN 1176 – Part 5 *(2018 DRAFT)***	
Clause	**Text**	**Clause**	**Text**
Scope		Scope	*Deletes the statement that the Standard is applicable to carousels of diameter greater than 500mm.* *Adds the following sentence:* Where the main play function is not rotating, the relevant requirements in this part of EN 1176 may be used, as appropriate.
		3.1	**Carousel (definition)** *Deletes the words "without oscillation" from the definition.*
		3.3	**Carousel type B (definition)** *Adds the size requirement "…≥500mm …" to the definition.*
3.4	**carousel type C** *ZZ Appendix adds new Note as follows:* NOTE Elevated spinning objects can cause serious injuries to those not on the equipment and should be designed and positioned to reduce the potential for impact.	3.4 & Figure 3	**Carousel type C (definition)** *Adds an additional figure showing types of Carousel type C*
		3.5 & Figure 4	**Carousel type D (definition)** *Adds the following 2nd part of the definition:* type D2: sliding ring or user stations on a track, set in motion by users holding on to a non-rotating support or by gravity if the track is inclined *Adds diagram depicting type D1 carousel (similar to Kompan Supernova)*
		3.6	**Carousel type E (definition)** *Drops the name "giant revolving disks"*
		3.7 & Figure 6	*Adds the following definition:* **Carousel type F** carousel with a bowl-like profile retaining one or more users and not encouraging standing while in motion *Adds figure 6 depicting 2 example images.*

		3.8 - deleted	*Deletes the definition – "carousel range"*
		3.11	**Carousel axis (definition)** *Adds the following note:* Note 1: The carousel axis may oscillate in some designs.
		4.1	**Safety requirements – General** *Adds the following paragraph:* Carousels not clearly defined by any of the pre-defined types in this part should be evaluated based on a risk assessment and using the applicable requirements from each type together with the general requirements. Risk assessment should be based on comparison with the carousel type most similar to the new design.
4.2	**Free height of fall and impact area** *ZZ Appendix deletes third paragraph and replaces with the following:* When tested in accordance with AS/NZS 4422, the impact area around the carousel shall correspond to a critical fall height greater than 1 500 mm. NOTE A speed of 5 m/s is equivalent to a fall height of 1 250 mm.	4.2	**Heights and impact area** *Modified text as follows:* For each type of carousels, maximum heights of user stations are defined in Table 1. Due to speed's influence on impact, some types of carousels have increased attenuation requirement for the impact area. Surfaces of those carousels are required to have an adequate level of impact attenuation at a height greater than the position of the user station (see Table 1). The extent of impact area of each type of carousels is given in Table 1. *Adds Table 1 – detailing max height of user stations; max FHOF; Min extent of impact area; Free space*
		4.3	Free space/falling space *Deletes the paragraph specifying the extent of the free space/falling space (this has now been covered in Table 1)* *Deletes Figure 6b.*
		4.4	*Adds the following clause:* **Entrapment** Due to centrifugal forces, entrapment requirements apply to all openings in the rotating structure, excluding the ground clearance distance. Following requirements given in EN 1176-1:2017 apply: - 4.2.7.2 for head and neck entrapment - 4.2.7.5 for foot and leg entrapment - 4.2.7.6 for finger entrapment In situations where the user can rotate around a static pole or the pole rotates independently to the user, the risk of hair entanglement shall be minimized in the following ways: - Static poles shall have a diameter of ≥ 75 mm; and - the gaps in the joints shall be sealed or shielded.

		4.5 (4.4 in old version)	**User Stations** *Deletes original text and replaces with the following:* If user stations are designed to include a hand grip, they shall conform to EN 1176-1:2017, 4.2.4.6. When tested in accordance with EN 1176-6:2017, Annex E, no protrusion in the leading edges of the carousel within its free space below 1 800 mm shall project through the outer face of the test ring. Inclination requirements are only applicable to those types where specifically defined.
			Deletes the following clauses in the old Standard: *4.5 Axis* *4.6 Speed of rotation* *4.7 Grip handles*
		5.1	**Carousel type A** *Adds the following sentence to the end of the 3rd paragraph:* User stations that are supplied with seats shall be equipped with a backrest. *Replaces the 5th paragraph with the following:* The leading edge at potential points of impact for both directions of each seat shall comply with one of the following: - The surface shall have a 10 mm thick rubber of ≤ 60 Shore A hardness or other materials with equal attenuation; - When tested in accordance with EN 1176-2:2017, Annex B, the surface shall show no peak values of acceleration greater than 50 *g* and the average surface compression shall not exceed 90 N/cm2.
		5.2.1	**Carousel type B - General** *Replaces the clause with the following:* Note: For this type of carousel there is a danger of entrapment under the carousel platform. An additional danger is that the construction of the carousel has parts, such as bolts and superstructure that protrude into the space between the underside of the carousel platform and the ground. The carousel shall comprise an enclosed solid platform with constituent elements that revolve in the same direction. The axis shall be vertical within +/- 5°. Outer edge of the platform shall form the perimeter of the carousel. Carousels type B that include a stationary central hand-wheel shall be constructed to avoid any entrapment, e.g. the central column and the hand wheel shall be fully enclosed without any protruding parts.

		5.2.2	**Rotating platform flush to the ground** *Deletes the reference to "vertical" gap and "vertical" displacement.*
		5.2.3	**Rotating platform not flush with the ground** *Replaces the clause with the following:* The ground clearance shall be 60 mm to 110 mm, or ≥ _400 mm. For loose fill materials, the ground clearance is measured from the ground level mark and 400 mm can be reduced to ≥ 300 mm. NOTE Displacement of the surfacing protects from crushing under the platform. Difference between the minimum perimeter and the maximum perimeter of the rotating platform shall be ≤ 50 mm. Any corners shall be rounded with 50 mm (see Figure 9).
		5.2.4 - deleted	*Deletes clause 5.2.4 "Rotating platform between 110 mm and 400 mm with a skirt"*
		5.2.5 - deleted	*Deletes clause 5.2.5 "Rotating platform over 400 mm with a skirt"*
		5.2.5 - deleted	*Deletes clause 5.2.6 "Rotating platform over110 mm without a skirt"*
		Figures	*Deletes the following figures in the old version:* *Figure 8 – Ground clearance for carousel type B.* *Figure 9 – Requirements for skirts for platform ground clearance between 110mm and 400mm.* *Figure 10 – Requirements for skirts for platforms with a ground clearance greater than 400mm.* *Adds figure 9 – Roundness of platform*
		5.3.1	**Carousel type C – General** *Adds the following to the ned of the clause:* When a single suspension is longer than 400 mm, the section of the suspension extending below the height of 2 000 mm shall have a diameter > 25 mm (for chains, the overall width of the chain link shall be > 25 mm). NOTE A stiffer rope, depending on its diameter and construction, will make it more difficult to create a loop, thus reducing the risk of strangulation. However, it will still allow good grip.

		5.3.2	*Merges clauses 5.3.2 "Structural integrity" and 5.3.3"Suspended user station impact requirements" into a single clause 5.3.2 "Structural integrity and impact attenuation" as follows:* Suspended user stations mounted < 1 800 mm above the installation surface, when tested dismounted from the carousel in accordance with EN 1176-2:2017, Annex B, shall show no peak values of acceleration greater than 50 *g* and the average surface compression shall not exceed 90 N/cm2. The top supporting structure shall be designed such a way that failure of the bearing cannot cause the top structure to become detached from the main structure.
		5.3.4	**Free space/falling space** *Deletes the paragraph specifying the extent of the free space/falling space (this has now been covered in Table 1)*
		5.4.2	*Adds the following clause:* **Carousel type D2** The gap between the track and the rotating structure shall be less than 5mm. The rotating structure shall have a minimum height of 230 mm at the lowest position. If hand or feet supports are provided, they shall be tested in accordance with EN 1176-6:2017, Annex E, and no protrusion shall project through the outer face of the test ring.
		5.5	**Carousel type E** *Merges all parts of the original clause (5.5.1, 5.5.2, 5.5.3, 5.5.4 & 5.5.5) into the following single clause:* The upper side of a rotating disc shall be a continuous surface, free of obstacles and smooth. For type E, the ground clearance shall be at least 300 mm for loose fill materials and 400 mm for non-displacing surfaces such as synthetics when measured as shown in Figure 10.
		5.6	*Adds new clause:* **Carousel type F** **Note:** The principal feature of type F is to retain the users which helps to reduce the risk of the users unintentionally leaving the unit when subjected to the centrifugal forces created whilst the unit is in motion. Equipment should discourage standing on them, which may be achieved by e.g.: - lack of upper body support; - lack of surface to stand on (e.g. not constant, wavy, having large openings, unstable, heavily inclined).

			Equipment should retain the user. This can be achieved by e.g.: - dished profile; - lack of rim that invites to sit on; - handholds in low position.
		5.7	*Adds new clause:* **Carousel with a diameter of less than 500mm** Carousels with a diameter less than 500 mm are considered to have no forced movement. If a centre pole is provided, the height of the pole shall be 900 mm to 2 000 mm. For parts of the pole less than 1 800 mm in height when measured from the platform shall be tested in accordance with EN 1176-6:2017, Annex E, and no protrusion shall project through the outer face of the test ring. The structural strength of the centre pole shall be confirmed by calculations or by pulling horizontally at height of 900 mm measured from the platform with a force of 1 kN for 5 min. Permanent deformations greater than 10 mm measured from the pulling point shall not occur. The pole or its attachments shall allow grip or grasp. Only spinners with a pole can be used as a part of a cluster.

Summary of differences between the Australian Standard (AS 4685:2014) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

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AS 4685 – Part 6 **EN 1176 – Part 6**

Clause	Text	Clause	Text
No changes.			

Summary of differences between the Australian Standard (AS 4685.11:2012) and the European Standard (EN 1176:2017)

Note: This comparison does not include some minor text changes that have no bearing on the intent of the clause.

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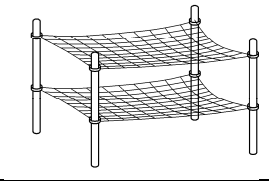
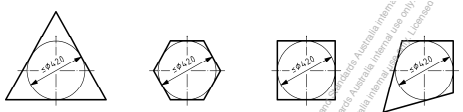
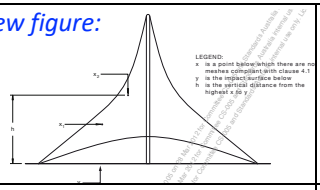
AS 4685 – Part 11		EN 1176 – Part 11	
Clause	**Text**	**Clause**	**Text**
Scope	*ZZ Appendix adds new paragraph after the first paragraph:* This Standard is not applicable to planar nets, including an assembly of two or more planar nets or planar elements of mixed mode structures. For guidance on planar nets and elements, see AS 4685.1.		
Figure 1 c)	*ZZ Appendix deletes figure 1c)* 		
3.2	**3-dimensional arranged planar nets** *ZZ Appendix deletes clause.*		
4.2	**Mesh size in 3-dimensional arranged planar nets** *ZZ Appendix deletes clause.*		
4.3	**Protection against injuries in the falling space** *ZZ Appendix adds Note 3 as follows:* NOTE 3: Due to the possibility of users jumping from spatial nets, a risk assessment should be conducted to determine the need to extend the fall zone and/or to enhance the impact attenuating properties of the playground surfacing.		
Figure 4	*ZZ Appendix deletes figure.*  Figure 4 — Principal measurement of effective diameter of mesh size		

Figure 5	*ZZ Appendix deletes Figure 5 a) and replaces with new figure:* 		
4.4	**Converging parts** *ZZ Appendix deletes first paragraph – "Converging parts within spatial networks shall be exempt from the requirements of EN 1176-1:2008, 4.2.7.2 b)."*		
4.5	*ZZ Appendix adds new Clause 4.5 as follows:* **Secondary support system** Where the structural integrity of the spatial net could be compromised by the failure of any one anchoring point there shall be secondary means of supporting the spatial net to prevent collapse.		
5	**Test reports** *ZZ Appendix deletes Clause 5 and replaces with the following:* Test reports shall be in accordance with the following: a) test report regarding compliance with AS 4685.11; b) certification of conformity with the relevant requirements of AS 4685.1 and AS 4685.11; c) the number and date of this Australian Standard, i.e. AS 4685.11:2012; d) details of the equipment tested; e) details of the condition of the equipment including any defects observed before the test; f) details of any change in the condition of the equipment observed after the tests; and g) test results.		