



Challenge Courses

Australian

Adventure Activity

Good Practice Guide

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1.0	17 April 2019	Pre-release version. Final guidance content.

Foreword

“Adventure is worthwhile” – Aristotle

The Australian Adventure Activity Standard and Good Practice Guides are designed to ensure effective, responsible, sustainable and safe delivery of adventure activities to dependant participants. They can help people across the outdoor sector to develop appropriately managed adventure activities which enhance individuals and our communities, while protecting the environment and culturally significant places. In doing this, these documents can help ensure that people will continue to enjoy the benefits of adventure activities well into the future.

Best wishes for all your adventures.

The Australian Adventure Activity Standard Steering Committee.

Preface

About these documents

The **Australian Adventure Activity Standard (AAAS)** and related **Good Practice Guides (GPG's)** are a voluntary good-practice framework for safe and responsible planning and delivery of outdoor adventure activities with *dependent participants*.

The AAAS and related GPG's provide guidance on safety and other aspects of responsible activity delivery, such as respect for the environment, cultural heritage and other users. They are not a full legal compliance guide, nor are they a "how to" guide or field manual for outdoor activities. They do not provide guidance on providing a high-quality experience over and above safe and responsible delivery.

Activity *providers* are encouraged to obtain independent professional and legal advice in relation to their obligations and duties in delivering adventure activities and should reference the relevant laws to the area in which they intend to undertake the adventure activity.

Does the Standard and Good Practice Guides apply to me?

The AAAS and related GPG's are specifically designed to help activity *providers* who are conducting activities involving *dependent participants*, to provide a safe and responsible experience. It is for each *provider* to determine based on their own individual circumstances, if they are working with *dependent participants* or not.

A *dependent participant* is a person owed a duty of care by the activity *provider* who is reliant upon the *activity leaders* for supervision, guidance or instruction to support the person's participation in an activity. For example, this often includes participants under the age of 18, participants lacking the ability to safely undertake the activity, or participants reasonably relying on the activity *provider* for their safety. The degree of dependence may vary during an activity.

Considerations for determining if a person is a *dependent participant* may include, but is not limited to:

- the foreseeable level of *competence* of the participant in the activity and the associated level of reliance this creates on the *activity leaders*
- the level of foreseeable self-reliance of the participant to reasonably manage their own safety
- the possible variation throughout the activity of the level of reliance
- the variation of the degree of dependence throughout the activity
- the individual context, nature and circumstances of the activity
- the relevant circumstances and particular facts relating to the responsibilities assumed by the *provider*.

An activity *provider* can be any organisation – business, community group, government agency, school or any other groups – that organises and leads adventure activities. Individuals can also be an activity *provider*, if they have the ultimate legal duty of care to participants. In general, 'the Standard' and GPG's relate to a provider as a 'whole organisation', rather than to 'specific roles' within the provider 'organisation'.

Some providers may have their own standards or guidelines appropriate to their duty of care. It is recommended that these be reviewed periodically to ensure current duty of care expectations are met. 'The Standard' and 'GPG's' may aid such reviews.

Are they legally binding?

The AAAS and GPG's are voluntary, not legal requirements. However, they may refer to specific laws and regulations which may be legally binding on activity *providers*.

While the AAAS and 'GPG's' are voluntary, some *land managers* and other organisations may require compliance. This may be as a condition of obtaining a licence, permit or other permission, or some other condition (e.g. a contract).

Under Australian common law and relevant legislation, *providers* have a legal duty of care towards *dependent participants* in some circumstances. In broad terms, the legal duty requires *providers* to take reasonable care that their actions and omissions do not cause reasonably foreseeable injury to *dependent participants*.

The AAAS and GPG's are not legal advice, and they cannot answer whether a legal duty exists in specific circumstances. All adventure activity *providers* should check what legal requirements apply in their own situation and seek legal advice if at all in doubt.

Even in cases where participants are not dependent, other legal duties and obligations may arise. The AAAS and GPG's have not been developed for those contexts.

Structure of the Standard and Good Practice Guides

The AAAS (i.e. the Standard) has a related Core Good Practice Guide (Core GPG). They both include guidance that applies to all adventure activities. They set out recommendations for a common approach to risk management that can generally apply regardless of the specific activity being undertaken.

Individual activity Good Practice Guides include guidance on specific adventure activities.



For any given activity, (i) the AAAS (the Standard), (ii) the Core GPG and (iii) the activity Good Practice Guide that applies to that specific activity, should be consulted.

The AAAS and Core GPG cover only those activities specifically listed. While the AAAS and Core GPG may be useful in managing *risk* generally for other activities, they may not reflect good practice for such other activities.

Interpretation of the Standard and Good Practice Guides

The following words and phrases are used in all documents and have specific meanings:

- **Must:** used where a provision is mandatory, if the *provider* is to operate fully in accordance with AAAS or GPG's. (This is equivalent to the keyword "shall" used in other voluntary standards e.g. *Standards Australia*, other *International Standards Organisations (ISO's)* etc.)
- **Should:** used where a provision is recommended, not mandatory. It indicates that the *provider* needs to consider their specific situation and decide for themselves whether it applies or is relevant
- **Can/cannot:** indicates a possibility and capability
- **May/need not:** indicates a permission or existence of an option

- But are not limited to: used to indicate that a list is not definitive and additional items may need to be considered depending on the context.

The following formatting is used throughout:

- Defined words are in *italics*. They are defined in the Glossary.
- The main key words are in *italics*.
- Examples are in *smaller italic 9-point font*.
- In document references are in underlined. References are to section heading titles.
- External references are in dotted underline italic.

Creation

The AAAS and GPG's were developed with the input from a wide range of outdoors and adventure activity experts with extensive field experience. They draw on state and territory-specific standards previously in place across Australia. The development process included work by a range of technical expert working groups, as well as open consultation throughout the community of activity providers and other experts.

Further details of the creation of the AAAS and GPG's can be found at www.australianaas.org. The Steering Committee wishes to thank all the Technical Working Group (TWG) members for their work and contributions.

It is intended that the AAAS and GPG's will be regularly updated to reflect changing practice and better understanding over time. Updates will be noted on the website www.australianaas.org.

1 Introduction

1.1 Challenge courses

A Challenge Course is a temporary, mobile or permanent physical structure comprising of either an individual or series of *elements*, where a person requires a fall protection system should they fall from an element. A challenge course *may* include *slacklining* and activities at 'play centers' and 'climbing adventure centers'. A challenge course excludes structures or *elements* that involve abseiling, rock climbing, artificial surfaces climbing or *bouldering* (refer to the [Abseil and Climb Good Practice Guide](#) for these activities).

Challenge courses are also known as challenge ropes courses. *Participants* are required to use dexterity, strength, balance and complex physical movements to successfully traverse the element or course of elements. Challenge courses are often used for experiential learning, personal challenge or team building purposes but also for entertainment. *Adventure games* and *low obstacles* may also be a part of the challenge course.

Fall protection systems differ for *low elements*, *adventure games* and *high elements*.

Low element(s) (also known as low ropes or obstacle courses) is any element or series of elements for which the appropriate fall safety is achieved through *spotting* and/or an impact absorbing system. Some physical structures do not require fall safety and are called *low obstacles* to indicate when this is the case.

Spotting is a support process provided by a person, or persons, who offer physical protection of the head and upper body of a person should they fall.

High element(s) (also known as high ropes) is any element for which safety can no longer be achieved by spotting and requires a *belay system* using harnesses and specialist safety equipment or other established methods or systems. *High elements* may include but is not limited to swinging elements as well as *flying foxes*. In some circumstances spotting *may* be required while transitioning from a low to high fall height or visa-versa, as the 'stretch' in the *belay system* means it can only function as intended over a certain *fall height*.

An *element* is considered a *temporary element* when it remains in place no longer than seven consecutive days.

Adventure games (also known as initiative games) are activities which are not identifiable as a *low element* or *high element* activity, but which require spotting to ensure participant safety. *Adventure games* may be conducted as separate activities or as part of a warm-up for challenge course activities. *Adventure games* are covered by this GPG.

1.2 Exclusions

Activities that are not covered by this GPG are:

- *Abseiling* either on *natural* or *artificial* surfaces ([refer Abseiling and Rock Climbing GPG](#))
- *Bouldering* either on *natural* or *artificial* surfaces ([refer Abseiling and Rock Climbing GPG](#))
- Games, sports or activities that are not *Adventure Games*
- *Rock climbing* either on *natural* or *artificial* surfaces ([refer Abseiling and Rock Climbing GPG](#))
- Activities that do not involve a *belay system* (e.g. *mud runs*, 'playground equipment', etc)
- Competitive activities (e.g. *adventure races*, etc.).

1.3 Related activities

Possible related activities *may* include:

- *Abseiling*, *Climbing* or *Bouldering* either on *natural* or *artificial* surfaces ([refer Abseiling and Rock Climbing Good Practice Guide](#)).

2 Management of risk

2.1 Management of risk

There are no additional specific activity provisions other than Core Good Practice Guide - Management of Risk provisions.

3 Planning

Also refer Core Good Practice Guide – Activity Planning.

3.1 Activity plans

Additional challenge course activity planning considerations *may* include but are not limited to:

- site characteristics such as:
 - supervision line of sight
 - waiting areas
- element characteristics such as:
 - difficulty
 - height
 - belay system used
- *activity leader competencies* required
- activity progression
- appropriate warm-up or lead-up activities (*e.g. trust, cooperation, communication*)
- suitable options to allow “challenge by choice”
- operating procedures and instructions that need to be provided
- participant training required (*e.g. spotting, belaying, attaching to safety systems*)
- any other relevant considerations listed in this document and the Core Good Practice Guide.

3.2 Emergency management planning

Refer Core Good Practice Guide – Emergency management planning.

The use of relevant rescue systems and procedures *must* be practiced periodically.

4 Participants

Refer Core Good Practice Guide – Participants.

4.1 Information provided pre-activity

Pre-activity information *should* clearly communicate:

- expectations and activity conditions
- as per Core Good Practice Guide – Participants.

An appropriate pre-activity assessment *should* be conducted to ensure *participants* have the necessary pre-requisite skills & knowledge to undertake the activity.

4.2 Participant considerations

Appropriate procedures *must* be in place to address risks associated with *participants* living with or experiencing an impairment.

Also refer Core Good Practice Guide – Participants: Restrictions.

4.3 Participant health and wellbeing

Potential measures to assist in providing positive participant experiences *may* include but are not limited to:

- providing the activity as an option so it is 'challenge by choice'
- providing a scaled level of experience to build participants level of skill, knowledge and experience
- providing real choice in terms of activity entry and exit options
- providing a briefing of hazards and risks and how these are managed
- considering the group dynamics when grouping participants
- providing emotional support through a supportive environment and positive rapport
- building and maintaining positive relationships within the group
- reducing as much as practical any discomfort from the equipment used.

5 Environment

5.1 Environment and site related planning

For course and element details refer to Equipment section 6.1 Artificial surfaces and elements design and construction.

Other environmental considerations other than climate or weather for challenge courses *may* include but is not limited to:

- the possible fauna at the challenge course
- the terrain surrounding the challenge course.

5.2 Course design and construction

Refer to Equipment section 6.1 Artificial surfaces and elements design and construction.

5.3 Weather

5.3.1 Weather information

Appropriate sources *must* be used for:

- current and forecast weather
- current and forecast weather warnings.

5.3.2 Weather warnings

Refer Appendix 7 Weather warnings.

5.3.3 Weather triggers

Trigger points *must* be based on relevant Bureau of Meteorology weather forecasts and warnings and actual weather conditions.

The risk management plan and emergency management plan *should* include guidance on trigger points and associated actions for:

- wind speeds or wind gusts that make the course or element(s) unsuitable for use
- weather conditions that limit visual/verbal direct supervision
- lightning
- severe weather warnings
- thunderstorm warnings
- tropical cyclone advice: watch and warning
- cold temperature

- extreme hot temperatures.

Actions for weather triggers *may* include but are not limited to:

- cancellation of activity
- postponing the activity
- modifying the activity
- evacuating to a safe location
- avoid locations effected by tides or surf
- avoiding areas that have the potential for flash flooding
- preparations to avoid the risks associated with lightning
- preparations to avoid the risks associated with blizzards
- moving to areas that are protected from strong winds and/or hail
- managing risks of flying or falling items during strong winds.

5.3.4 Lightning

A lightning risk management procedure *must* be developed for the site.

Whilst thunder is audible groups *should* avoid:

- being on high elements
- being in unsuitable locations.

When thunder is audible, a suitable location *should* be sought, to wait out the thunder storm.

Considerations for locations to waiting out the thunder storm *should* include but not limited to avoiding:

- being on high elements
- being connected to metal structures, cable or equipment
- being on the highest ground in the area
- tall trees or structures that may act like a lightning rod
- water saturated ground near watercourses
- locations where a group is unable to spread out.

5.4 Bushfire, prescribed fire and fire danger

Refer Core Good Practice Guide - Bush fire, prescribed fire and fire danger.

5.5 Flooding

Areas subject to flooding or flood warnings *should* be avoided.

Areas likely to experience *flash flooding* *should* be avoided during severe weather or thunderstorms.

5.6 Wildlife safety

Procedures *should* be in place to minimise the risks associated with any fauna or flora that *may* be encountered.

The types of wildlife encounters that *may* need to be considered include but is not limited to:

- snakes
- ants
- bees
- wasps
- nesting birds
- other local fauna.

5.7 Tree safety

Refer Equipment sections [6.1 Artificial surfaces and elements design and construction](#) and [6.6 Inspection and maintenance](#) regarding requirements relating to courses or element(s) using trees as part of their structure.

Weather based trigger(s) as to when to avoid operating activities in or below trees *should* be established.

Where element(s) are located or the activities are regularly conducted under trees, a risk assessment of the trees by an appropriately *competent* person *must* be completed periodically.

5.8 Environmental sustainability information

5.8.1 Design and construction environmental sustainability

For environmental sustainability considerations refer to AS 2316.2.1:2016 Artificial climbing structures and challenge courses Part 2.1: Flying foxes and challenge ropes courses—Construction and safety requirements (EN 15567-1:2007, MOD). This *may* include items relating to flora and fauna (*e.g. tree usage, root systems, native habitats, etc.*).

5.8.2 Temporary elements environmental sustainability

As per section 5.8.1 above.

5.9 Environmental sustainability procedures

The *procedures may* include but is not limited to procedures listed in [Core Good Practice Guide - Environmental sustainability](#) and the following:

5.9.1 Travel and camp on durable surfaces

Travelling in an area on durable surfaces *may* include but is not limited to:

- utilise recognised tracks to approach and move within the challenge course
- locate waiting areas that have a firm base and can tolerate groups without causing vegetation damage and erosion
- actively managing participants to minimise trampling and damage to the surrounding vegetation
- utilise temporary erosion control or vegetation protection measures in heavy traffic areas around elements.

5.9.2 - Leave what you find

Leave what you find *may* include but is not limited to:

- rope protectors or slings *should* be used to protect trees or other vegetation if used for belay points
- steps *should* be taken to prevent soil compaction around the roots system of living trees.

5.9.3 - Be considerate of your hosts and other visitors

Be considerate of your hosts and other visitors *may* include but is not limited to:

- locate equipment, active participant(s) and participants non-actively participating so they allow free access to tracks
- encourage quiet communication to minimise the noise.

6 Equipment and logistics

6.1 Artificial surfaces and elements design and construction

Construction and/or operation of challenge courses *must* conform with any legislative or regulatory requirements of the relevant jurisdiction the activity operates in. (For example, 'amusement' structure laws.)

Permanent *artificial surfaces* and *element(s)* constructed specifically for use in activities *must* comply with relevant construction standards.

The relevant standard *may* include:

- AS 2316.2.1:2016 Artificial climbing structures and challenge courses Part 2.1: Flying foxes and challenge ropes courses—Construction and safety requirements (EN 15567-1:2007, MOD)
- AS 3533.1-2009: Design and construction
- AS 3533.1-2009/Amdt 1-2011: Design and construction
- AS 3533.2-2009: Operation and maintenance
- AS 3533.2-2009/Amdt 1-2011: Operation and maintenance
- AS 3533.3-2003: In-service inspections
- AS/NZS 4422:1996 Playground surfacing— Specifications, requirements and test method
- EN 795: Personal fall protection equipment – anchor devices.

Permanent *artificial surfaces* and *element(s)* constructed using superseded construction standards *should* be reassessed for ongoing suitability for use during maintenance inspection.

Temporary *artificial surfaces* and/or *temporary element(s)* *should* comply with either permanent artificial surfaces relevant requirements or be assessed by a competent person that it is fit for purpose for the activity.

Design of *high element(s)* and challenge courses *must* allow the use of an appropriate rescue system.

Systems *must* have a 'functional inspection' to confirm it is appropriately constructed and operates or performs it's required function. Refer [Appendix 5 Inspections and maintenance](#) for additional detail.

6.2 Equipment general

6.2.1 Equipment general principles

All equipment *must* be used with reference to the manufacturers' instructions.

Training in the use of equipment used *must* be provided to *activity leaders* and *participants*.

Before use, the compatibility between and the correct functioning of all equipment *must* be confirmed.

The elements used *must* be of a height that the fall height will allow the fall safety system to operate effectively.

Operation of challenge courses *must* conform with any legislative or regulatory requirements. (For example, 'amusement' structure laws.)

Equipment, connection methods and systems used *must* be periodically reviewed.

Equipment used *must* be appropriate for the activity context.

Equipment listed below *must* be manufactured for use in the context of the activity:

- Accessory cord
- Artificial fixed anchors used in elements
- Ascending devices
- Belay devices
- Cables, wires and other fixed ropes
- Carabiners or other connectors
- Descending devices
- Dynamic rope
- Harnesses
- Helmets
- Lanyards
- Pulleys
- Slings
- Static rope
- Any other equipment relied upon for safety systems.

6.2.2 Equipment loading

Equipment designed to be under load will have a *stated strength* that *may* or *may not* include a *safety factor*. The type of *stated strength* rating needs to be known before use to ensure equipment is safely loaded. (Refer [Appendix 3 Equipment load ratings](#) for more details).

Equipment with the *stated strength* providing the *Minimum Breaking Strength* (MBS) *must* have a suitable *safety factor* applied and a *Safe Working Load* (SWL) calculated.

Equipment with the *stated strength* providing the *Safe Working Load* (SWL) *must* be loaded only to a maximum of the *Safe Working Load* (SWL).

Reference to the manufacturers' instructions *must* occur when determining a *safety factor* and/or *safe working load*.

The expected peak load and possible additional loads if a rescue is carried out *must* be considered when determining equipment loading.

6.2.3 Smoking

There *must* be no smoking near and/or while wearing safety equipment.

6.3 Fall safety management systems

6.3.1 Fall safety systems

All safety equipment used in the safety management system and/or a *belay system* *must* be appropriate for the task.

An appropriate safety system *must* be used when at height on all *high elements*.

Procedures used for *belay systems* *must* be suitable for the equipment.

Procedures and systems used *should* be consistent throughout the challenge course activity session.

Any *belay system* or lanyard *must* be appropriate for the expected *fall factor* of a climber.

Also refer section [7.5 Fall safety systems management](#).

6.3.2 Ropes and lanyards used

The type of rope used in a *belay system* *must* be appropriate for the type of *high element*.

Considerations for selecting when *dynamic rope* or *static rope* is suitable for a belay system *should* include but is not limited to:

- the expected fall distance before the belay system halts the fall
- the amount of impact loading expected on the *climber*
- the *fall factor* involved
- if the elasticity of a *dynamic rope* during a fall *may* increase the risk of injury
- the amount of slack rope likely to be in the *belay system*, which *may* increase the fall distance and therefore the impact loading and *fall factor* on the climber.

Safety lanyards *must* be made of a suitable material (e.g. *flat webbing*, *tubular webbing*, *static or dynamic rope of suitable diameters*) that has an appropriate *safe working load*.

6.3.3 Connections

The connection system used *must* always provide an appropriate safe attachment, including at changeover/transition points.

Connection methods, equipment and systems used *must* be periodically reviewed.

Considerations when determining connection methods, equipment and systems *must* include:

- the type of equipment being used
- what systems if any are required to provide redundancy
- what needs to be attached and how
- the experience and context of who is completing the connection
- the availability of a *competent person* to supervise or check the connection that is completed by a participant.

6.3.4 Connectors – practices relating to use

The type of *connector* used *must* be suitable for the task.

Considerations for determining the type of *connector* suitable for a task *must* include:

- the likelihood of misalignment and/or loading the gate
- the likelihood of it becoming unlocked and/or disconnecting via a rollout
- the way it will be loaded
- the amount of exposure to vibration
- how often inspection of the connection can occur
- material the connector is made of compared to the type materials it will connect to.

Connectors made from appropriate materials *must* be used when connected to metal wire.

Carabiners *must* be used so that no load is across the minor axis or gate.

Systems that have loads applied and released so that alignment of *connectors* or equipment may change, or subject to vibration *should* be inspected at an appropriate frequency.

6.3.4.1 Harness connections

The connection of the harness *must* use:

- an appropriate knot to tie in or
- two methods of connection to provide redundancy, with any carabiners used being *locking carabiners* or
- a 'three way' *auto-locking* carabiner where 'clipping in' is the sole means of attachment or
- an appropriately tied girth hitch or
- a *tool locked* connector.

If using a *locking* connector (e.g. screwgate carabiner) to connect to a climber's harness, the connection *must* use two *locking* connectors in opposed orientation to each other.

The connection of the belayers harness to a belay device *must* use either a *locking* carabiner or *auto-locking* carabiner.

In situations where participants complete any connection to a harness:

- the *connector* or knot *must* be checked by a *competent person*
- and when a *competent person* may not check the connection, two methods of connection to provide redundancy *must* be used.

6.3.4.2 Lanyards connections to anchors and critical lines

The connection attaching climber's lanyards to any anchor points or *critical lines* *must* use:

- an *auto-locking* carabiner or
- an *interlocking device* or
- a *tool locked connector*.

6.3.5 Harnesses

Where required an appropriate harness *must* be used on all *high elements*.

6.3.5.1 Full body harnesses and combination chest & sit harnesses

Chest harnesses *must* only be used in combination with a sit harness.

A full body harness or combination chest and sit harness eliminate several potential harness related risks for challenge courses and it is suggested that when updating equipment, a preference for using full body harness's is considered.

The risk assessment *should* assess if harnesses need to be a full body harness or a combination chest and sit harness.

Use of a full body harness or combination chest and sit harness *should* be considered:

- for *flying foxes* and giant swings
- when inversion is intended or likely
- when the security of a sit harness cannot be relied upon due to body shape of the person
- when the security of a sit harness cannot be relied upon if the person were to experience a pre-existing health, medical or personal condition episode (e.g. *epilepsy*)
- for the very young
- based on the expected length of time in harness and positioning (e.g. *extended time periods at height*)
- based on law or regulatory requirements
- whenever updating harness equipment, given they eliminate several potential risks listed.

6.3.6 Rescue equipment

Appropriate vertical rescue equipment *must* be readily accessible.

Rescue systems used *should* be rated to carry a minimum of two people.

Rescue systems used *should* be able to be used to lift and to lower.

Considerations for rescue systems *should* include but is not limited to:

- load direction including multi-direction loads
- load magnitude
- ability to raise the person and rescuer
- ability to lower the person and rescuer
- ability to enable an *activity leader* to complete contact rescues.

Vertical rescue equipment *may* include but is not limited to:

- ascending device(s)
- belay device(s)
- carabiners (alloy/steel)
- claws or cowstails
- knife (preferably a rescue hook knife)
- lanyards
- pulleys
- prusik loops
- pair of pliers or multi-grips
- rescue rope equivalent in length to greater than twice the height of the highest element or belay wire or anchor point *should* be accessible and available for rescue
- slings
- relevant tools for opening devices or connectors.

Example equipment lists can be found in [Appendix 1 Challenge course equipment](#).

6.3.7 Assisted belay

Refer to sections above: [6.3.1 Fall safety systems](#), [6.3.2 Ropes and lanyards used](#), [6.3.4 Connectors](#), [6.3.5 Harnesses](#) and [6.3.6 Rescue equipment](#).

6.3.8 Self-belay including continuous self-belay

Also refer to sections above: [6.3.1 Fall safety systems](#), [6.3.2 Ropes and lanyards used](#), [6.3.4 Connectors](#), [6.3.5 Harnesses](#) and [6.3.6 Rescue equipment](#).

6.3.8.1 Self-belay system lanyards - Single piece or sheathed

Self-belay systems with lanyards *must* be designed to minimise possible user entrapment and pressure on the neck, head and/or helmet that may cause strangulation when loaded. (Refer [Appendix A6.3 Single piece or sheathed lanyards](#).)

6.3.8.2 Self-belay system with two safety lanyards

Self-belay systems with two safety lanyards *must* be designed to minimise possible user entrapment and pressure on the neck, head and/or helmet that may cause strangulation when loaded. (Refer [Appendix 6 Safety diagrams for lanyards](#).)

While progressing across an *element* while using a two-safety lanyard system, both lanyards of the *self-belay* system *should* be attached to the *critical line*.

6.3.9 Collective safety systems

Collective belay systems *must* have a 'functional inspection' to confirm it is appropriately constructed and operates or performs it's required function.

6.3.9.1 Soft-fall

Soft-fall used to protect from falls from height *must* conform to AS 2316.1—2009 – Part 1—2009 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls.

Where *soft-fall* is relied upon without the use of *spotting* it *must* cover the whole of the expected *fall zone*.

6.3.9.2 Barriers

Any barriers, railings or banisters to protect from a fall from height *must* conform to relevant building codes.

6.3.9.3 Deep Water

Any deep water pools used to protect from falls of height *must* conform with any required 'pool safety' legislative or regulatory requirements of the relevant jurisdiction the activity operates in.

Deep water to protect from falls of height *must* cover the whole of the *fall zone*.

The depth of water used to protect from falls of height *must* be sufficient so a person who falls unprepared avoids hitting the bottom. (*For example, deep enough if they fall and 'pin drop'.*)

The fall height into deep water used to protect from falls of height *must* be limited to protect a person falling from injury.

The deep water pool *must* allow suitable entry and exit from the water.

The deep water pool *must* have any required infrastructure to manage access (*e.g. fencing and gates to prevent accidental child drownings etc.*)

The water within the deep water pool *must* be suitable for a person to swim in.

6.3.9.4 Safety netting

Nets used to protect from falls from height *must* conform to:

- BS EN 1263-1:2014 Temporary Works Equipment – Safety Nets – Part 1: Safety Requirements, Test Methods
- BS EN 1263-2:2014 Temporary Works Equipment – Safety Nets – Part 2: Safety Requirements For The Positioning Limits.

6.3.10 Participant supplied safety equipment

Where a *participant* supplies any personal safety equipment, this *must* comply with this GPG and be appropriate and serviceable.

A procedure regarding *participant* supplied safety equipment *should* be developed.

6.4 Other equipment

6.4.1 Helmets

A risk assessment *must* determine when *active participant(s)* are required to wear a helmet.

A risk assessment *must* determine if anyone *non-actively participating* is required to wear a helmet.

Considerations for wearing a helmet *must* include risks:

- of head injury from falling objects
- of strangulation by the helmet chin strap caused by a helmet 'entrapment'
- of head injury from striking the head during falls or swings.

When a helmet is required to be worn it *must* be an appropriate helmet for the situation.

Areas and activities that require a helmet to be worn *must* be identified.

A helmet *should* be worn while climbing on *high elements*.

A helmet *should* be considered when climbing on *low elements*.

Also refer to [7.4.9 falling objects](#), [7.4.10 Entanglements](#), [7.5.3.1 Two lanyard safety systems](#) and [Appendix 6 Safety diagrams for lanyards](#).

6.4.2 Clothing

Procedures *must* be in place to ensure appropriate clothing is worn.

Considerations when determining appropriate clothing include but is not limited to:

- the requirements of the element(s) being used
- sun protection
- the weather conditions.

Also refer to [7.4.10 Entanglements](#).

Footwear *must* be fit for purpose.

Procedures *must* be in place to ensure appropriate footwear for the expected and foreseeable terrain is used.

6.4.3 Other personal equipment

Procedures *must* be in place to ensure a suitable drinking water supply is available.

6.5 Pre-activity equipment preparation and inspection

All equipment *must* be checked that it is serviceable before each activity or before being used.

Consideration *should* be given to implementing checks for damage in situations where unsupervised community access to equipment or elements could occur (*e.g. public access sites, vandalism, etc*).

A daily operations sheet *should* be used to record equipment and setup checks. (Refer to Australian Standard AS 2316.2.2)

6.6 Inspection and maintenance

Maintenance inspections *must* conform with any legislative or regulatory requirements.

Compliance with the Australian Standard AS 2316.2.1:2016 *may* include but is not limited to inspection, testing and maintenance requirements.

All *elements* and anchors used *must* be periodically inspected by an appropriately competent person, as per any relevant construction standard (*see appendix 2 for examples*), designer and/or constructor recommendation(s).

Appropriate procedures *must* be in place for inspections and determining the time periods between inspections.

Considerations for how regular the inspections occur *may* include but is not limited to:

- the characteristics of the site
- how many people use the site and how regularly
- any manufacturer's, designer's or constructor's recommendations where relevant
- the equipment being used.

Any tree used as part of an *element* *should* be periodically inspected by an appropriately *competent person* such as an arborist.

Any tree located within the challenge course area that presents a falling object risk *should* be periodically inspected by an appropriately *competent person* (*e.g. arborist*).

All equipment *must* be inspected periodically that it is serviceable.

Inspections *should* include but is not limited to:

- Surrounding area and ground
- Physical structures
- Materials and fittings
- Safety equipment.

Equipment and inspection records *must* conform with any legislative or regulatory requirements.

A record of inspection *must* be maintained.

Refer [Appendix 5 Inspections and maintenance](#) for additional detail.

An equipment record *should* be maintained.

Where used an equipment record *should* record but is not limited to the:

- item individual identifier
- date of purchase
- date of inspections
- recommended or maximum lifespan.

A retirement of equipment policy *should* be developed.

Considerations for a retirement of equipment policy *may* include but is not limited to:

- type of use
- frequency of use
- prevailing conditions when used
- actual deterioration, wear and tear
- age
- years in service
- manufacturers recommendations.

A system to identify equipment and elements *should* be used to assist reporting and recording faults or condition checks.

6.7 Storage of equipment

Activity equipment *must* be stored in accordance with the manufacturer's recommendations or instructions.

Where no manufacturer's recommendations exist, considerations for storage of equipment *may* include but is not limited to:

- equipment is clean and dry
- the storage is free from harmful chemicals
- the storage is free from damp conditions
- the storage is free from environmental exposure including Ultra Violet (UV) light and avoids extremes of temperature
- the equipment is free from interference from animals/pests.

7 Leadership

7.1 Leadership terminology conventions used

7.1.1 Level of supervision terms

A system to describe the different *level of supervision* *must* be used. (See an example system below.)

Supervision used can be described by the "level of supervision". This document uses the following three *levels of supervision*:

- *Level 1* – where a nominated person responsible for supervising others during all or part of the activity is able to physically intervene immediately. (Aligns with level 1 in AS 2316.2.2:2016 and *direct supervision* in the Core Good Practice Guide).
- *Level 2* – where a nominated person responsible for supervising others during all or part of the activity is able to visually see the *participant(s)* and verbally intervene immediately. (Aligns with level 2 as per AS 2316.2.2:2016 and *direct supervision* in the Core Good Practice Guide).

- *Level 3* – where a nominated person responsible for supervising others during all or part of the activity is in the vicinity and able to respond promptly to provide assistance when called upon. (Aligns with level 3 as per AS 2316.2.2:2016 and *indirect supervision* in the Core Good Practice Guide).

7.1.2 Leader naming conventions

The *activity leader* naming convention enables *activity leader* requirements in this activity Good Practice Guide to be related to Core Good Practice Guide requirements.

The leadership naming conventions for challenge course activities are:

- “Manager” and “Supervisor” is equivalent to Leader in Core Good Practice Guide.
- “Instructor” is equivalent to Assistant leader in Core Good Practice Guide.
- “Activity leader” is a collective noun referring to instructor(s), supervisor(s) and/or manager(s).

7.1.2.1 Instructor

Instructor (also known as a conductor): A person with the *competence* to supervise *participants* who are *active participants* on challenge course *element(s)*. An instructor *may* be a challenge course instructor: *low elements* and/or an instructor: *high elements*.

The competence of an instructor generally means that they:

- require defined operating procedures to follow when supervising *participants*
- require *Level 3* supervision by a supervisor or manager so that assistance is readily available if a non-routine situation arises
- guide *participants* but there is no intention of imparting activity skills or knowledge to *participants* beyond that which is necessary to enable their safe participation, although the conduct of the activity *may* achieve other education outcomes.

7.1.2.2 Supervisor

Supervisor: A person with the *competence* to independently supervise *participants* who are *active participants* on challenge course *element(s)*. A supervisor *may* be a challenge course supervisor: *low elements* and/or a supervisor: *high elements*.

The competence of a supervisor generally means that they:

- do not require supervision when supervising *participants* use of element(s)
- can apply their skills and knowledge to a broad variety of challenge courses and *elements*
- can provide *Level 1, 2 or 3* supervision of instructor(s)
- are able to deal with non-routine situations
- are able to teach the skills and knowledge required to conduct activities (i.e. able to train instructors).

7.1.2.3 Manager

Manager: A person with the *competence* to be a supervisor and to manage and maintain a challenge course. A manager *may* be a challenge course manager: *low elements* and/or a manager: *high elements*.

The competence of a manager generally means that they:

- can undertake all necessary activities related to a challenge course including supervisor roles
- can provide *Level 1, 2 or 3* supervision to instructors and supervisors
- undertake or manage the maintenance of the course or elements.

7.2 Competencies

7.2.1 Competencies overview

The Australian Adventure Activity Standard and Good Practice Guides refers to units from the Sport, Fitness and Recreation Training Package for descriptive statements of the knowledge and skills required of activity leaders.

The Training Package units are used for the sole purpose of providing descriptions for the knowledge and skills required. It is not intended to imply or require that specific formal training, assessment or qualification is the only means of gaining or recognising knowledge and skills.

Providers can recognise activity leaders as having the 'ability to apply knowledge and skills to achieve expected results' (i.e. competencies) in a number of different ways as detailed in Core Good Practice Guide - Recognition of competence.

The Training Package units listed can be found by searching for the units on the training.gov.au/Home/Tga website. The code provided with the unit name assists in this search.

7.2.2 Challenge course competencies

Also refer to Core Good Practice Guide - Competencies.

Refer to Appendix 9 Activity leader competencies.

7.2.3 Recognition of competence pathways

Refer to considerations for recognition pathways outlined in Core Good Practice Guide - Competencies.

7.3 Supervision requirements

7.3.1 Supervision plan

Supervision requirements *must* be documented in a challenge course supervision plan.

Activity supervision *must* be implemented according to the challenge course supervision plan.

A challenge course supervision plan *must* include:

- a course diagram for visual reference
- a summary of the risks identified in the risk assessment
- supervision requirements for the challenge course
- specific locations to operate supervision from
- obstructions (e.g. trees, structures, etc.) and/or conditions (e.g. sun location, mist, etc.) that may impact supervision visibility and procedures to overcome these
- relevant manufacturers specifications or requirements
- activity leader roles and responsibilities
- activity leader competencies including any special competencies for each element
- activity leader pre-deployment confirmation of competence, training or orientation required
- communications plan
- emergency response plan.

Also refer Appendix 8 Challenge course supervision plan.

7.3.2 Group size considerations

Considerations when determining group size *must* include:

- site capacity
- site related legislation or regulation
- the time allowed to enable all participants in the group to complete the activity is sufficient and realistic and does not compromise safety
- having appropriate supervision for *participants non-actively participating*
- considerations for determining group size outlined in Core Good Practice Guide.

7.3.3 Supervision ratio considerations

Considerations in determining challenge course supervision requirements *should* include but are not limited to:

- the nature and design of the *elements*
- requirements for the *belay system(s)* and transfer between belay system(s)
- time for the *activity leaders* to allow all *participants* to undertake the activity being sufficient and realistic and does not compromise safety
- the ability to see and/or hear *active participants*
- the number of *active participants* enables activity leaders to adequately monitor, detect and correct improper procedures
- having appropriate supervision for *participants non-actively participating*
- the potential for *activity leader* fatigue
- emergency event and/or rescue requirements
- considerations for determining supervision requirements in Core Good Practice Guide.

An appropriately *competent person* *must* establish supervision requirements and standard operating procedures for element(s) and/or the challenge course.

7.3.4 Participants that are non-actively participating

Consideration *must* be given to the type of supervision *participants* required when *non-actively participating* i.e. who are waiting to undertake the activity.

In cases where *participants* who are *non-actively participating* require *Level 1 or 2* supervision, that supervision *must* be provided by an *activity leader* not providing *Level 1 or 2* supervision of an activity or by a *responsible person* as appropriate.

7.3.5 Assessment of participants use of safety systems

Each *participant* *must* be assessed to confirm they have sufficient reach to use and operate the safety systems while retaining an appropriate footing. (For example, there may be a minimum height requirement to reach or connect belay systems.)

An assessment *must* be completed to confirm each *participant* is competent to carry out the relevant safety instructions and safety system operation.

The assessment to confirm each *participant* is *competent* to carry out the relevant safety instructions and safety system operation *must* be completed without exposure to risks, serious injury or death. (For example, use of test system or element.)

Where the *participant* has been assessed as *competent* to carry out the relevant safety instructions and safety system operation, ongoing supervision *must* monitor and check the *participants* actual use for continued *competence* before adjusting the *level of supervision*.

7.3.6 Supervision provided

Supervision for *collective belay* systems *must* be determined by the risk assessment and supervision plan.

The maximum number of separate *elements* one *activity leader* can supervise *must* be determined by the risk assessment and supervision plan.

7.3.6.1 High elements supervision

When *high elements* are in use there *must* be at least one *activity leader* available with supervisor or manager competencies.

All people at height irrespective of the level *competence must* be appropriately supervised.

When multiple active *participants* are at height on high element(s), there *should* be a minimum of two *activity leaders* included in the supervision plan.

7.3.7 Pre-activity course preparation supervision

A safety system *must* be used when undertaking pre-activity setup or safety inspection that has a fall from height hazard.

When a *belay system* is used, there *must* be another person:

- aware that the *belay system* is in use
- monitoring the setup of the activity or the safety inspection (*e.g. level 3 supervision*)
- who can promptly respond if there is an emergency.

7.3.8 Supervision of connectors & connections

Self-closing connectors that are *non-locking* *must not* be used.

All *locking connectors* that are not *tool locked* or *auto-locking* (*e.g. screwgate carabiners*) *must* be appropriately supervised throughout the activity to ensure they remain locked.

The first/initial connection of *climbers* and *belayers* to the safety system *must* be supervised or checked before being relied upon. (Refer [Leadership 7.3.5 - Assessment of participants use of safety systems](#) above.)

7.3.9 Supervision for different situations

The recommended level of supervision, minimum recommended usage checks and suggested supervision ratios that *should* be used are in the following table.

The table is to be used in conjunction with other [Leadership 7.3 Supervision requirements](#) sections above.

(Refer table next page.)

Supervision for different situations table

Safety system	Assessment	Checking use after assessment (Refer note 1 and 3)	Rest of the system (Refer note 1 and 3)	Suggested ratio (Refer to note 1 and 2)
Low elements or adventure games	Level 1	Level 1 or 2 as appropriate	Level 2 thereafter when spotting required	1:18 active participants with a maximum of 8 climbers
			Level 3 (see note 7) thereafter when no spotting required	1:24 active participants
Assisted or team belay (Note 5)	Level 1	Level 1 check each use	Level 1 check each use	1-4 belay systems (Note 4)
Auto belay	Level 1	Level 2 with a minimum of 3 uses checked	Level 2 thereafter	1:12 climbers
Self-belay	Level 1	Level 2 with a minimum of 5 uses checked	Level 2 thereafter if connectors are: <ul style="list-style-type: none"> • auto-locking or • triple action auto-locking 	1:12 climbers
			Level 3 (see note 6) thereafter if connectors are: <ul style="list-style-type: none"> • tool locked, • interlocking device or • interlocking device - tool activated 	1:15 climbers
Continuous self-belay	Level 1	Level 2 with a minimum of 3 uses checked	Level 3 (see note 6) thereafter if connectors are: <ul style="list-style-type: none"> • tool locked, • interlocking device or • interlocking device - tool activated 	1:18 climbers

Notes:

1. Use course designers or course builders recommendations for the site and/or elements when available. Site specific recommendations *must* be used in preference to generic suggestions that lack an understanding of the specific site or element involved.
2. When site specific course designers or course builders ratio recommendations are not available, the suggested ratios in the table need to be revised for the specific site or elements by considering:
 - Leadership 7.3.6 - Supervision provided requirements and recommendations above and
 - Leadership 7.3.2 - Group size considerations section above and
 - Leadership 7.3.3 - Supervision ratio considerations section above.
3. When site specific course designers or course builders' levels of supervision and assessment checking recommendations are not available, the suggested assessment checking recommendations in the table need to be revised for the specific site or elements.
4. An important consideration in determining the supervision ratio includes but is not limited to the proximity of the belay stations.
5. Includes all other types of safety systems not specified elsewhere (e.g. haul systems, "donkey belays", "glider possum" etc.)
6. Use of *Level 3* supervision on *high elements* *must* only be used where the course has a suitable design and equipment and appropriate procedures for *participant* induction, assessment and progress monitoring.
7. Use of *Level 3* supervision for *low elements* or *adventure games* when no spotting required *must* only be used where the course or adventure game is of appropriate design for the *participants*.
8. Refer glossary for definitions for *levels 1, 2 or 3*.

7.4 Activity management

7.4.1 Knowledge of site

Activity leaders must have an induction to the activity site that includes supervision requirements in the supervision plan and any relevant specific activity site procedures.

The knowledge of the activity site that *activity leaders* require before leading *participants* at that site, *should* be considered when allocating *activity leader* roles.

7.4.2 Pre-activity equipment preparation

Rescue equipment *must* be checked that it is serviceable and ready for immediate use before each activity.

7.4.3 Activity leader positioning

Procedures *should* enable *activity leaders* to respond to emergencies and complete rescues in an appropriate time frame.

7.4.4 Activity leader fatigue and repetition

Considerations for *activity leader* fatigue *should* include but is not limited to:

- time required to complete tasks
- task repetition
- weather (*e.g. hot temperatures etc.*).

Considerations in managing *activity leader* fatigue and task repetition risks *should* include but are not limited to:

- group sizes and the number of groups
- role rotation
- suitable breaks.

7.4.5 Spectators

Any spectators *should* be directed to an appropriate waiting area to view the activity.

7.4.6 Participants belaying and spotting

Considerations for when *participants* operate *belay systems* *must* include:

- *participants* are willing and capable
- appropriate training is provided
- the need for ongoing monitoring to ensure:
 - correct technique is used
 - attention to the task is maintained
 - equipment is used correctly
- backup systems to support the *belay* (*e.g. using a backup belayer*)
- the relative weights between the *belay* and *climber*, where the *belay*'s weight is integral to the correct function of the belay and the *belay* is not anchored.

Considerations for when participants are spotting *should* include but are not limited to:

- *participants* are willing and capable
- appropriate training is provided
- the need for ongoing monitoring to ensure:
 - correct technique is used
 - attention to the task is maintained.

7.4.7 Activity information for participants

The information required to be provided to *participants* *must* be determined prior to the activity.

Required information *must* be provided at the appropriate time before or during the activity.

Activity information that *should* be provided to *low element* or *adventure game participants* includes but is not limited to:

- appropriate personal clothing requirements
- relevant hazards and risks
- any expectations required of the participant
- specific areas they need to know about (*e.g. waiting areas, belay areas, where safety equipment is to be worn, areas not to be entered*)
- how to access the elements
- communications and systems used to manage the flow and safety of the activity
- the correct fitting of and care of any personal safety equipment
- appropriate technique(s) for the activity
- method for “falling off” and “recovering”
- correct method of *spotting*.

Activity information that *should* be provided to *high element participants* includes but is not limited to:

- information provided for *low element* or *adventure game participants* above
- element specific hazards or risks
- the correct use of the *belay systems* and/or any other fall protection systems
- appropriate technique(s) for the activity
- the release procedures for *belay system* or other system
- procedures for exiting or being lowered back down.

Where there is only has one *activity leader*, the group *must* be briefed on what action to take to enact the emergency management plan if the *activity leader* becomes injured or incapacitated.

7.4.8 Activity Communications

A clear & unambiguous communication system *must* be used to manage the activity.

For example:

- system of safety operation such as confirming “on belay” or “off belay”
- safety communication from *activity leader* to *participant* and *activity leader* to *activity leader*.
- safety communication *participant* to *participant*
- emergency situations.

7.4.9 Falling objects

Procedures to minimise the possibility or impact of falling objects *must* include:

- checking the site prior to use
- ensuring helmets are worn where relevant as per the equipment section
- designating waiting areas that reduce the exposure to falling objects
- briefing *participants* on potential hazards and how to avoid dislodging objects
- briefing *participants* on the appropriate action and warnings to give if an object does fall
- managing groups so that the groups and individual’s exposure within potential falling object areas is minimised
- minimising movement between areas that are located below others
- supervision of *participants* while they are located above others.

Procedures to minimise the possibility or impact of falling objects *should* include but are not limited to:

- placing belay areas wherever possible so that they are not directly under the *climber*
- managing spectators and/or other people moving through the area.

7.4.10 Entanglement and snags

To avoid entanglement in ropes and devices:

- long hair *must* be secured to stop it being able to be entangled
- loose jewellery (e.g. bracelets and necklaces) and watches *should* be removed or secured
- loose clothing *should* be secured
- clothing and hat drawstrings *should* be secured.

To avoid being caught or snagged, where there is such a risk:

- rings *should* be removed or tapped over
- body piercings *should* be removed or taped over
- loose jewellery (e.g. bracelets and necklaces) and watches *should* be removed or secured.

The *activity leaders should* monitor belay rope(s) to keep them at the appropriate length and tension, to prevent the possibility of a slack rope becoming entangled or snagged.

7.4.11 Falls from height

Considerations for the likelihood of a fall from height *should* include but are not limited to:

- the stability and grip of the surface being stood on
- obstacles that need to be negotiated
- abilities of *participants* including the ability to follow instructions.

To protect from a fall from height, procedures *must* include checking *participant(s)*:

- equipment is correctly fitted before they need to rely on the belay system
- correct attachment to the belay system, safety or other systems.

Checking equipment and attachment *must* not be delegated to the *participants* themselves, unless they have demonstrated *competence* in the procedure(s) and then only for checking their own equipment or attachment.

To reduce the potential for falls from height, procedures *must* include:

- ensuring ropes are of a sufficient length for the element
- removing unnecessary slack in *belay system* before use
- monitoring the correct use of *belay systems*
- monitoring attaching to anchors or *belay systems*
- monitoring belay rope(s) to keep them at the appropriate length
- monitoring *belay systems* to remove unnecessary slack in belay ropes
- providing appropriate instruction to mitigate risks caused by the stretch in dynamic rope.

To reduce the potential for falls from height, procedures *should* include:

- designating what areas that are not to be entered
- designating waiting areas
- designating areas that can only be accessed when attached to the *belay system*
- checking participant's equipment is correctly fitted before they need to rely on the *belay system*
- checking correct attachment to the *belay system*, safety or other systems
- anchoring the *belayer* where the *belay system* relies substantially on the *belayers* weight to arrest a fall and the weight of the abseiler or climber is greater than that of the *belayer*.

Consideration *must* be given to the need for separately *spotting climbers* when starting their ascent, until such time the *climber* reaches a fall height where the *belay system* will full operate to stop their fall before they touch the *fall zone*.

7.5 Fall safety systems management

7.5.1 Belay and activity systems

Procedures to ensure that all *activity leader* supervised systems function as intended *must* include:

- anchor systems and equipment are suitable for the activity, site and *participants*
- appropriate knots and connections are used
- regular inspection of all anchors and connections where practicable
- operating procedures and checks used will prevent unplanned disconnection of any part of the system
- checking attachment and disconnection to the system during the activity.

Appropriate assessment *should* consider and address the possible differences between *participant* and *activity leader* usage of systems.

Where a *belay system* relies on a lanyard, throughout the climb the *climbers* harness attachment point *should* not be higher than the anchor point that the lanyard is attached to. (This means the *fall factor* on a lanyard *should* not exceed 1.0 – refer [Appendix 4 - Fall factors](#).)

7.5.2 Assisted belay

Where *participants* are *belaying*, they *must* be instructed and appropriately supervised.

Where a *belay system* requires a *belayer*, either the *belayer* *must* be:

- verified as a *competent belayer* or
- under *Level 1 or 2* supervision of an *activity leader*.

7.5.3 Self belays

7.5.3.1 Two lanyard safety systems

Procedures *must* be in place to minimise the likelihood of placing a head/neck between the two lanyards when using a two-lanyard safety system. (For example, informing of procedures to reduce risk, lanyards are kept in front while using, lanyards are held together while progressing.)

7.5.3.2 Auto belays and continuous self-belays

Procedures to ensure that all *auto belay* and *interlocking continuous self-belay* systems function as intended *must* include:

- anchor systems and equipment are suitable for the activity, site and participants
- appropriate knots and connections are used
- operating procedures and checks used will prevent unplanned disconnection of any part of the system
- appropriate training of *participants* in use of the “automated systems”
- confirming *competence* of *participants* in using the “automated systems” prior to them undertaking the activity without *Level 1 or 2* supervision
- ongoing *level 3* supervision of the activity.

7.5.4 Collective belays

7.5.4.1 Barriers

A risk assessment and supervision plan *must* consider if monitoring is required to ensure fixed barriers are effective.

7.5.4.2 Soft-fall

A risk assessment and supervision plan *must* be used to determine the supervision required when falls from height are solely protected by *soft-fall*.

7.5.4.3 Deep water

Supervision of deep water pools used to protect from falls of height *must* conform with any required 'pool safety' legislative or regulatory requirements of the relevant jurisdiction the activity operates in.

Supervision arrangements *must* include:

- appropriate rescue requirements
- appropriate training of *activity leaders* responsible for water rescue
- *Level 1 or 2* supervision visual supervision at all times in the event a person becomes unconscious while in the water.

7.5.4.4 Netting

A risk assessment and supervision plan *must* be used to determine the supervision required when falls from height are protected by netting.

7.5.5 Spotting belays – low elements and adventure games

Where *participants* are *spotting* they *must* be instructed and appropriately supervised.

Where a safety system requires a *spotter*, either the *spotter must* be:

- a *competent spotter* or
- under *Level 1 or 2* supervision of an *activity leader*.

The number of *spotters* required and their location in relation to the *climber must* be determined prior to the activity for each *element* or *adventure game*.

Considerations in determining the number of *spotters* and their location *should* include but are not limited to:

- the nature and design of the *element* or *adventure game*
- the likelihood of falling and possible directions of the fall
- whether the *element* has 'holds' on vertical, inclined and/or overhanging surfaces
- the body orientations of the *climber* that the *element* or 'holds' permit, or the *adventure game* requires
- obstacles in the *fall zone*
- the use of padding to protect from hazards in the *fall zone* and/or hard landings
- the number of *active participants* enables *activity leaders* to monitor, detect and correct improper procedures.

7.5.6 Flying foxes

A full body harness or combination chest and sit harness *must* be considered when using a flying fox, to mitigate the risk of falling out of a sit harness when inverted.

7.5.7 Giant swings

A full body harness or combination chest and sit harness *must* be considered when using a giant swing, to mitigate the risk of falling out of a sit harness when inverted.

7.5.8 Rescue systems

Rescue systems *must* allow for a timely and effective rescue.

Activity leaders climbing on *high elements must* carry appropriate rescue equipment to enable descent to the ground.

7.5.9 Harness hang syndrome

Harness hang syndrome is a medical complication due to being “suspended within a body harness for a prolonged period of time (5 to 30 minutes)” (reference: Australian Resuscitation Council – Guideline 9.1.5 – July 2009). Harness hang syndrome can lead to blood pooling, “shock”, unconsciousness and/or death. It is also known as ‘suspension trauma’ or ‘suspension syndrome’.

Emergency management plans *must* include:

- rescue of unconscious persons suspended in a harness
- guidance on trigger points for considering the possibility of ‘harness hang syndrome’ occurring
- appropriate actions to follow where ‘harness hang syndrome’ is suspected, including but not limited to the relevant first aid treatment.

Glossary

Also refer terms and definitions from Core Good Practice Guide.

AAAS: Australian Adventure Activity Standard

Active Participant: a participant who is either a *climber*, *abseiler*, *belayer* or *spotter*.

Activity leaders: the collective noun for instructor(s), supervisor(s) and/or manager(s).

Adventure Games (Also known as initiative games): an activity which is not identifiable as a *low element* or *high element* activity, but which require *spotting* to protect a participant if they fall. Activities that do not require *spotting* are games.

Artificial surface(s): a man-made structure. Also called ‘artificial structures’ and *may* include but is not limited to portable climbing/abseiling walls, climbing gyms, challenge course elements, fixed climbing/abseiling or other towers, buildings and bridges.

Assisted belay (also known as ‘dynamic belay’ and ‘team belay’): *belay system* operated by at least one person who is not the *climber*.

Auto belay: a specialized belay device that operates automatically and removes the need for a belayer.

Auto-locking: a *connector* that will automatically lock to prevent it from opening and requires two or more deliberate actions to unlock.

Belay line: the line that is used in an *assisted belay* to connect to the *climber*.

Belay System: the means by which the *climber* or *abseiler* is protected from an uncontrolled fall or descent.

Belayer: a person that operates the *belay system*.

Bouldering: a form of climbing activity, limited in height and for which fall safety can be achieved by the provision of an impact absorbing system, by a *spotter* providing control of a fall or by a combination of these measures.

Carabiner: (refer *connector*).

Climber: the person who is protected by *spotting* or a *belay system*.

Competence: ability to apply knowledge and skills to achieve expected results.

Competencies: the plural of competence. Having competence in more than one ability.

Competent leader/participant/person/assessor: someone who has the *competence* to perform specific functions.

Connector(s): a metal device used to link components together. A connector *may* be:

- *Non-locking:* a *connector* that cannot be locked to prevent it opening
- *Self closing:* a *connector* that automatically closes
- *Locking:* a *connector* that can be manually locked and unlocked without a tool to reduce the possibility of it opening
- *Tool locked:* a device that requires a tool to manually lock and unlock. (*A maillon is an example of a tool locked connector.*)
- *Auto-locking:* a *connector* that will automatically lock to prevent it from opening and requires two or more deliberate actions to unlock.

Contact rescue: a rescue requiring an *activity leader* to manoeuvre to the persons actual location to physically assist them.

Collective belay: a fall from height safety system that operates without a person intervening or operating it. (*For example, soft-fall or a pool of water in a fall zone, guardrail, fence etc.*)

Continuous belay: *belay system* that enables climbers to progress from one activity system element to the next and that does not require *climbers* to undo or change the connection to the *belay system*.

Continuous self-belay: *belay system* operated by the *climber* that enables *climbers* to progress from one activity system element to the next and that does not require *climbers* to undo or change the connection to the *belay system*.

Critical line: a part of an *element* that a safety system attaches to.

Dynamic belay: refer *assisted belay*.

Dynamic rope: a specially constructed kernmantle rope that is somewhat elastic under load. The elastic 'stretch' under load is what makes the rope 'dynamic'. (Also see *static rope*.)

Element: a temporary, mobile or permanent physical structure where a person requires a system to protect them from an uncontrolled fall or descent.

Fall height: The vertical distance between the *climbers* or abseilers lowest body element and the surface beneath.

Fall factor: is the ratio of the height of a fall (h) (measured before the rope or lanyard begins to stretch) and the rope or lanyard length available to absorb the energy of the fall (L). It is used as a representation of the severity of a fall when arrested by a belay system. It is calculated by (h) divided by (L).

Fall zone: The surface that can be hit by a *climber* or abseiler falling.

Flash flooding: is flooding in a localised area with a rapid onset, usually as the result of relatively short intense bursts of rainfall.

Flying fox: a means of travel along a sloping rope or wire by attaching to it using a free moving pulley and being propelled by gravity.

GPG: Good Practice Guide

High element: (also known as high ropes) is any *element* or series of *elements* where the *fall height* means fall safety requires a *belay system* using harnesses and specialist safety equipment or other established methods or systems.

Initiative games: See *adventure games*.

Interlocking device: a *belay system* using two lanyards that have interconnected carabiners, so that when one carabiner is locked it automatically leads to unlocking the other one and vice-versa.

Level 1, 2 or 3: describes the type of supervision provided to participants. The level meaning is:

- *Level 1* – where a nominated person responsible for supervising others during all or part of the activity is able to physically intervene immediately. (Aligns with level 1 in Australian Standard AS 2316.2.2:2016 and *direct supervision* in the Core GPG).
- *Level 2* – where a nominated person responsible for supervising others during all or part of the activity is able to visually see the participant(s) and verbally intervene immediately. (Aligns with level 2 in Australian Standard AS 2316.2.2:2016 and *direct supervision* in the Core GPG).
- *Level 3* – where a nominated person responsible for supervising others during all or part of the activity is in the vicinity and able to respond promptly to provide assistance when called upon. (Aligns with level 3 in Australian Standard AS 2316.2.2:2016 and *indirect supervision* in the Core GPG).

Level of supervision: a category system that indicates the type of supervision provided to *participants*. (Refer *Level 1, 2 or 3* for the categories used in this GPG.)

Locking: a *connector* that can be manually locked and unlocked without a tool to reduce the possibility of it opening.

Low element (also known as low ropes or obstacle courses): any *element* or series of *elements* where the *fall height* means fall safety can be achieved by *spotting*, using an impact absorbing system or by a combination of these measures.

Low obstacle(s): a temporary, mobile or permanent physical structure where a person does not require a system to protect them from an uncontrolled fall or descent. (Also refer *low element*.)

Minimum Breaking Strength (MBS): is the magnitude of a load that may permanently distort or damage equipment but not cause it to break. (Refer Appendix 3 Equipment load ratings). Equipment *should* never be loaded to the MBS, even for testing purposes when testing a system before being use, the test *should* not exceed the *safe working load (SWL)*.

Natural surface(s): the geologic structure and flora that forms a cliff or steep face.

Non-actively participating: a *participant* that is waiting to but is not currently doing the activity.

Non-locking: a *connector* that cannot be locked to prevent it opening.

Participant: a person who undertakes an activity and is not a *activity leader* for the activity.

Responsible person: a *competent* person who is able to complete delegated elements or tasks during an activity that does not require the activity-specific *competence* of an *activity leader*.

Safety Factor: the ratio between the *Minimum Breaking Strength (MBS)* and *Safe Working Load (SWL)* to provide a safety margin. It is expressed as a ratio, example 8:1. (Refer Appendix 3 Equipment load ratings).

Safe Working Load (SWL): is the magnitude of load that does not permanently distort, weaken, damage or break equipment and includes a safety margin. (Refer Appendix 3 Equipment load ratings).

Self-belay (also known as static belay): *belay system* that is operated by the climber.

Self closing: a *connector* that automatically closes.

Self locking: (see *connectors – auto-locking*).

Slackline: a type of *element* formed by a length of flat webbing that is tensioned between two anchors.

Soft-fall: an impact-absorbing surface.

Spotter(s): a person or persons who are *spotting*.

Spotting: a support process provided by a person, or persons, who offer physical protection of the head and upper body of a person should they fall. (Note: The term “spotting” is sometimes used to describe providing *level 2* supervision on *high elements*. Terms used can vary and providers can use whatever

terminology they prefer. In this document note that “spotting” is used to identify situations only as defined. This is to avoid any potential confusion between *low element* and *high element* requirements.)

Stated Strength: the magnitude of load that is either the *Minimum Breaking Strength* (MBS) or *Safe Working Load* (SWL) marked on equipment or listed in the manufacturers literature. (Refer [Appendix 3 Equipment load ratings](#)).

Static belay: see *self-belay*.

Static rope: a specially constructed low stretch kernmantle rope, that has low elongation under load. The low elongation or ‘stretch’ under load is what makes the rope ‘static’. (Also see *dynamic rope*.)

Team belay: a type of *assisted belay*. (Also see *assisted belay*.)

Temporary element: an *element* that does not remain in place no longer than consecutive seven days.

Tool locked: a device that requires a tool to manually lock and unlock. (A maillon is an example of a tool locked connector.)

Waiting areas: a location in which to wait prior to undertaking the activity, where it is reasonable for a person to not be required to use equipment to protect them from a fall from height.

Appendices

Appendix 1 Challenge course equipment

The equipment required and the appropriate “type” of equipment used is dependent on the specific context of the activity.

Equipment used for challenge courses *may* include but is not limited to:

A1.1 High elements specific equipment

- accessory cord
- artificial fixed anchors used in elements
- ascending devices
- belay devices
- wires and other fixed ropes
- carabiners or other connectors
- descending devices
- dynamic rope
- harnesses
- helmets
- lanyards
- pulleys
- shear reduction devices
- slings
- static rope
- tethers.

Rescue equipment *may* include but is not limited to:

- additional rope
- ascenders
- belay device
- carabiners
- climbing cord
- cowstails or claws
- knife suitable for cutting ropes (preferably a rescue hook knife and on a lanyard)
- pliers or multi-grips
- prusik loops
- pulleys
- slings.

A1.2 Low elements specific equipment

Specific equipment for *low elements* may include but is not limited to:

- *softfall*, crash pads or padding.

A1.3 General equipment

General equipment used for challenge courses *may* include but is not limited to:

Emergency/rescue

- documentation (see Core Good Practice Guide – activity leader required documentation)
- emergency communication equipment (see Core Good Practice Guide – emergency communication)
- first aid kit in waterproof storage (see Core Good Practice Guide – first aid equipment and medication)
- a waterproof method of storing and carrying documentation and communications equipment
- specific activity context equipment required (see list above)
- emergency shelter where appropriate for the context
- emergency equipment to keep a patient warm (*e.g. mat, sleeping bag*) where appropriate for the context.

Activity Leaders

- communications equipment (standard communication rather than emergency communication where this differs) and spare batteries or backup “power banks”
- pen/pencil and blank writing paper
- watch or equipment suitable to tell and measure time for first aid purposes
- head torch and spare batteries
- gloves
- same as for participant.

Participant

- personal medications (including for asthma and anaphylaxis)
- personal hygiene requirements
- clothing appropriate to the weather conditions
- sun hat
- sunglasses
- spare prescription glasses
- sunscreen
- gloves.

Group

- first aid kit (refer Core Good Practice Guide for first aid kit common content)
- insect repellent
- rubbish bags
- sunscreen
- water
- food for duration plus spare
- backpack to carry equipment
- repair kit
- multi-tool with knife
- hand sanitiser
- trowel for toileting
- toilet paper.

Appendix 2 Equipment related standards

Challenge courses:

- AS 2316.2.1:2016 Artificial climbing structures and challenge courses Part 2.1: Flying foxes and challenge ropes courses—Construction and safety requirements (EN 15567-1:2007, MOD)
- AS 2316.2.2:2016 Artificial climbing structures and challenge courses Flying foxes and challenge ropes courses – Operation requirements (EN 15567-2:2007, MOD)
- EN 15567-1:2015 Sports and recreational facilities. Ropes courses. Construction and safety requirements.

Fixed and mobile artificial climbing and abseiling walls:

- AS 2316.1—2009 – Part 1—2009 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls.

Equipment and the relevant standards:

- Accessory cord (EN 564)
- Braking devices (EN 15151-1, EN 15151-2)
- Carabiners or other connectors (EN 362, EN 12275, AS/NZS 1891.4 or ISO 10333-5)
- Chocks (EN 12270)
- Crash pads/padding (AS 2316.1—2009 – Part 1, UIAA 161-3)
- Descending devices (EN 341)
- Energy absorbing systems EN 958
- Frictional anchors EN 12276
- Helmets (EN 12492)
- Harnesses (EN 358, EN 361, EN 813, EN 12277, AS/NZS 1891.4 or equivalent)
- Lanyards (EN 354)
- Safety nets (BS EN 1263-1:2014, BS EN 1263-2:2014)
- Rock anchors (EN 959)
- Rope clamps EN 567
- Rope – dynamic (EN 892)
- Rope – static (EN 1891, AS 4142.3, CI 1801)
- Personal fall protection equipment – anchor devices (EN 795)
- Pitons (EN 569)
- Pulleys (EN 12278)
- Slings (EN 566, AS 1353 (series) or AS/NZS 1891.4)

List of relevant standards

AS/NZS

- 1353 Flat synthetic-webbing slings Product specification
- 1891 Industrial fall-arrest systems and devices
- 4 Part 4: Selection, use and maintenance
- AS 2316.1—2009 – Part 1—2009 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls.
- AS 2316.2.1:2016 Artificial climbing structures and challenge courses Part 2.1: Flying foxes and challenge ropes courses—Construction and safety requirements (EN 15567-1:2007, MOD)
- 2512 Methods of testing protective helmets 1 Part 1: Definitions and headforms

CI

- 1801 Low Stretch And Static Kernmantle Life Safety Rope

EN

- 341 Personal protective equipment against falls from a height—Descender devices
- 354 Personal protective equipment against falls from a height—Lanyards
- 358 Personal protective equipment for work positioning and prevention of falls from a height—Belts for work positioning and restraint and work positioning lanyards
- 361 Personal protective equipment against falls from a height—Full body harnesses
- 362 Personal protective equipment against falls from a height—Connectors
- 564 Mountaineering equipment—Accessory cord—Safety requirements and test methods
- 566 Mountaineering equipment—Slings—Safety requirements and test methods
- 567 Mountaineering equipment—Rope clamps—Safety requirements and test methods
- 569 Mountaineering equipment. Pitons. Safety requirements and test methods
- 795 Personal fall protection equipment. Anchor devices
- 813 Personal fall protection equipment—Sit harnesses
- 892 Mountaineering equipment—Dynamic mountaineering ropes—Safety requirements and test methods
- 958 Mountaineering equipment. Energy absorbing systems for use in klettersteig (via ferrata) climbing. Safety requirements and test methods
- 959 Mountaineering equipment. Rock anchors. Safety requirements and test methods
- 1263-1:2014 Temporary Works Equipment – Safety Nets – Part 1: Safety Requirements, Test Methods
- 1263-2:2014 Temporary Works Equipment – Safety Nets – Part 2: Safety Requirements For The Positioning Limits.12270 Mountaineering equipment. Chocks. Safety requirements and test methods
- 12275 Mountaineering equipment—Connectors—Safety requirements and test methods
- 12276 Mountaineering equipment. Frictional anchors. Safety requirements and test methods
- 12277 Mountaineering equipment—Harnesses—Safety requirements and test methods
- 12278 Mountaineering equipment—Pulleys—Safety requirements and test methods
- 12492 Mountaineering Equipment – Helmets For Mountaineers – Safety Requirements And Test Methods
- 15151-1 Mountaineering equipment. Braking devices. Braking devices with manually assisted locking, safety requirements and test methods
- 15151-2 Mountaineering equipment. Braking devices. Manual braking devices, safety requirements and test methods
- 1891 Personal protective equipment for the prevention of falls from a height—Low stretch kernmantel ropes

ISO

- 10333 Personal fall-arrest systems
- 10333-5 Part 5: Connectors with self-closing and self-locking gates

UIAA

- 161-3 Crash Pads

Appendix 3 Equipment load ratings

Proper understanding and use of equipment load ratings (*stated strength*) is needed to allow for an appropriate safety margins (*safety factors*) to be used. This ensures that equipment is never loaded to a point it is in danger of breaking or being damaged.

Manufacturers provide details of the load ratings for equipment either stamped on the equipment or in available documentation. This is called the *Stated Strength*. *Stated Strength* is the magnitude of load that is either the *Safe Working Load* (SWL) or *Minimum Breaking Strength* (MBS).

It is critical to understand the difference between *Safe Working Load (SWL)* and *Minimum Breaking Strength (MBS)* because SWL has a safety factor already applied to it, while MBS does not.

Safe Working Load (SWL): is the magnitude of load that does not permanently distort, weaken, damaged or break equipment. It is safe to load equipment to 100% of the SWL.

Minimum Breaking Strength (MBS): is the magnitude of a load that may permanently distort or damage a piece of equipment but not cause it to break. An appropriate *safety factor* needs to be applied to the MBS. The MBS is a load, determined by the manufacture, that might not break a piece of equipment but may make it unusable or unsafe to use. Equipment *should* never be loaded to the MBS, even for testing purposes when testing a system before being used, the test *should* not exceed the SWL. Some equipment may be in danger of being overloaded even at less than half the MBS. It should be noted that the stated MBS value is calculated from tests on a selection of items, not on each individual item. It is therefore likely that a small percentage of similar items, (usually less than 1%) will break slightly below their stated MBS value.

Safety Factor: The ratio between the *Minimum Breaking Strength (MBS)* and *Safe Working Load (SWL)* which is used to provide a safety margin. It is expressed as a ratio for example 8:1. An appropriate *Safety Factor* is chosen based on the type of equipment and intended use. The *safety factor* applicable may be specified in relevant standards or manufactures instructions. It is recommended to follow known safe practices, manufacturers recommendations, relevant standards or calculated assessments when determining safety factors.

A3.1 Examples

A3.1.1 Rope

Recreational 'climbing/abseiling' rope may have the *Stated Strength* provided as a *Minimum Breaking Strength (MBS)*. In use, it requires a suitable *Safety Factor* to be selected and applied to the MBS to calculate appropriate SWL.

Static rope:

- Stated strength: 30kN MBS
- Safety Factor: say 8:1
- Safe Working Load (SWL): 3.75kN (30 divided by 8 = 3.75)

Flat lifting sling:

A flat lifting sling may have the *Stated Strength* provided as a *Safe Working Load (SWL)*. In use, it can be loaded to 100% of the SWL.

- Stated strength: 2,000 kg SWL
- Safety Factor: may or may not be provided by manufacturer
- Safe Working Load (SWL): 2,000 kg (No calculation required as Stated Strength given as SWL)

The Australian Standard AS1353 states that a 2,000 kg SWL flat lifting sling *should* have a 8:1 safety factor. If this is the case, then the MBS is 16,000 kg (2,000 times 8 = 16,000).

A3.1.2 Connectors

Recreational 'climbing/abseiling' connectors may have the *Stated Strength* provided as a *Minimum Breaking Strength (MBS)*. In use, it requires a suitable *Safety Factor* to be selected and applied to the MBS to calculate appropriate SWL.

In-line loaded carabiner:

- Stated strength: 24kN MBS
- Safety Factor: say 4:1
- Safe Working Load (SWL): 6kN (24 divided by 4 = 6)

All equipment needs to have its *Safe Working Load* (SWL) estimated using an appropriate *safety factor* for the context it is being used. They are not to be loaded above their SWL.

Case example

On the 4th of May 2014, in Rhode Island USA, a 45kN carabiner was overloaded and failed with a 6.8kN three-way load, causing 8 circus performers to fall 10m. The subsequent investigation showed that similar carabiners, in new condition, also failed when similarly loaded but easily held 50kN when in-line loaded.

A3.2 Kilonewtons (kN) of force vs kilograms (kg) of load (mass)

Newtons, (abbreviated to N) are the metric units of force. A 102kg object applies, approximately, 1,000 N, (1kN) downward force at the surface of the earth, (due to its mass and gravity). One Kilonewton (1 kN) is 1,000 N.

In a simple vertical loading situation, it is generally accurate enough to convert a load mass of 100 kg to a force of 1kN. Forces can exist in any direction, not just up and down. Force is calculated by multiplying mass by acceleration. Gravity at earth's surface produces approximately 10m/s² of acceleration, (the exact value varies and is slightly less).

Therefore, equipment rated 1 kN of force equals equipment rated approximately 100kg of load (1,000N divided by 10 = 100kg of load). So 1kN of force = approximately 100kg of load. Note that peak loads can vary and allowance for these *should* be made.

A3.2.1 Examples:

SWL 3.75kN force equals approximately 375kg static load

- Calculation: 3.75 times 1,000 = 3,750N with 3,750N divided by 10 = 375 or
- Calculation: 3.75 times 100 = 375

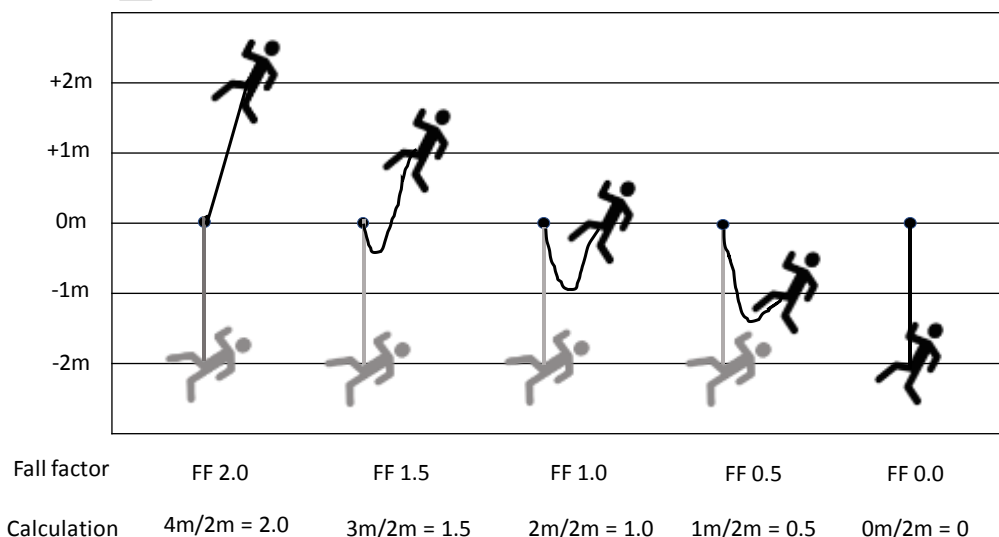
SWL 2,000kg static load equals approximately 20kN force

- Calculation: 2,000kg times 10 = 20,000N with 20,000N divided by 1,000 = 20 or
- Calculation: 2,000kg divided by 100 = 20

Appendix 4 Fall factor

Fall factor: is the ratio of the height of a fall (h) (measured before the rope or lanyard begins to stretch) and the rope or lanyard length available to absorb the energy of the fall (L). It is used as a representation of the severity of a fall when arrested by a belay system. It is calculated by (h) divided by (L).

Fall factor diagram:



Appendix 5 Inspections and maintenance

Also refer section [6.6 Inspections and maintenance](#).

An ongoing inspection and maintenance procedure is essential for ensuring the integrity of the challenge course structure and associated equipment.

There are various types of inspections:

- Inaugural
- Ongoing:
 - Routine visual
 - Operational
 - Periodical
 - Tree.

A5.1 Inaugural inspection

An inaugural inspection *must* be completed before a newly built course is put into service. It only needs to be completed once.

The inaugural inspection *must* be conducted by a suitably competent challenge course inspector. A thorough understanding of how the equipment will be used is required. It is very important that the inspector be independent from the manufacturer and owner of the new course.

The purpose of the inaugural inspection is to check that the:

- design is functional
- design calculations, tree reports and weld inspections exist
- course has been constructed as per the design
- manufacturer instructions exist for usage, inspections and maintenance requirements.

Manufacturers of challenge courses need to specify the frequency of ongoing inspections, and any special inspection or maintenance requirements.

A5.2 Ongoing inspections

There are four layers of ongoing inspections. The purpose of each is to ensure that the structure is safe, and that damage to and degradation of materials is detected before failure.

A5.2.1 Routine visual check

The routine visual check *must* be completed by a competent person before each use of the course.

Daily inspection is usually done by a well trained instructor.

The inspection looks to confirm:

- there is no obvious damage
- site is safe
- the integrity of the safety systems.

A5.2.2 Operational inspection

The operational inspection *should* be completed by a competent person at least quarterly, or as per the manufacturers advised requirements.

It *should* include:

- all of the routine visual checks
- a more detailed closer inspection to confirm no damage or degradation. Examples *may* include but is not limited to loose bolts, damaged or rotten timber, tightness of ropes/wires/elements, damaged/worn wire rope etc.

A5.2.3 Periodical inspection

The periodical inspection *should* be completed by an independent competent person annually or as per the manufacturers advised requirements. The time between periodical inspection *should* be no more than 15 month between inspections.

It *should* include:

- Routine visual check
- Operational inspection
- Assessment of worn components
- And where the inspector deems necessary:
 - dismantling of parts,
 - excavation to reveal condition of items underground and/or
 - routine proof testing.

A5.2.4 Tree inspections

If the challenge course is built in trees, the trees *should* be inspected, by a competent person annually or as per the manufacturers advised requirements.

Inspection of trees *should* also be considered if the course is built among or beneath trees.

The time between periodical inspection *should* be no more than 15 month between inspections.

Expert arboriculturists *should* be used to verify that the trees are in good health and fit for purpose. Arboriculturists are usually not required to be experts in the forces imposed on the trees by the ropes course.

Inspection reports

All reports *should* be retained.

A5.3 Maintenance

Maintenance is typically defined as “like for like replacement of worn out parts”.

Maintenance is usually performed by a suitably competent person specialised in building challenge courses.

Modifications

A modification occurs if maintenance changes the functional operation of the challenge course, or the loads imposed on the course. A modification usually requires a new inaugural inspection.

Examples of modification *may* include but is not limited to:

- adjusting the sag in a flying fox so that it runs faster or slower
- re-locating an element to make its span longer.

Appendix 6 Safety diagrams for lanyards

A6.1 Introduction

Also refer: Equipment Section for detail of other requirements relating to lanyards.

Also refer: [6.4.1 Helmets](#) in equipment section regarding helmet entrapment.

Equipment section [6.3.8 Self-belay including continuous self-belay](#) notes that: *Self-belay* systems with lanyards *must* be designed to minimise possible user entrapment and pressure on the neck, head and/or helmet that may cause strangulation when loaded.

Considerations discussed below are:

- Using unequal lengths of lanyards or having sufficient gap between lanyards
- Having single piece or sheathed lanyards.

A6.2 Unequal lengths or gap between lanyards

Self-belay systems with two safety lanyards *must* minimise possible user entrapment and pressure on the neck, head and/or helmet that may cause strangulation when loaded by either:

- having unequal lanyard lengths so in the event of a fall, one lanyard is loaded and the second lanyard remains loose when both are attached to the belay anchoring system OR
- having sufficient gap between the two lanyards so even if both are loaded, entrapment between the lanyards does not occur (*e.g. both lanyards are held apart by a 'rigid spreader'*).

A6.2.1 Unequal length lanyards

Usual practice is to leave both lanyards attached to *critical line* (i.e. belay anchoring system/anchor point) during progress across an element.

Where unequal length lanyards are used, in the event of a fall the different lengths ensure that only one lanyard is loaded. The second lanyard remains loose to prevent creating an entrapment hazard.

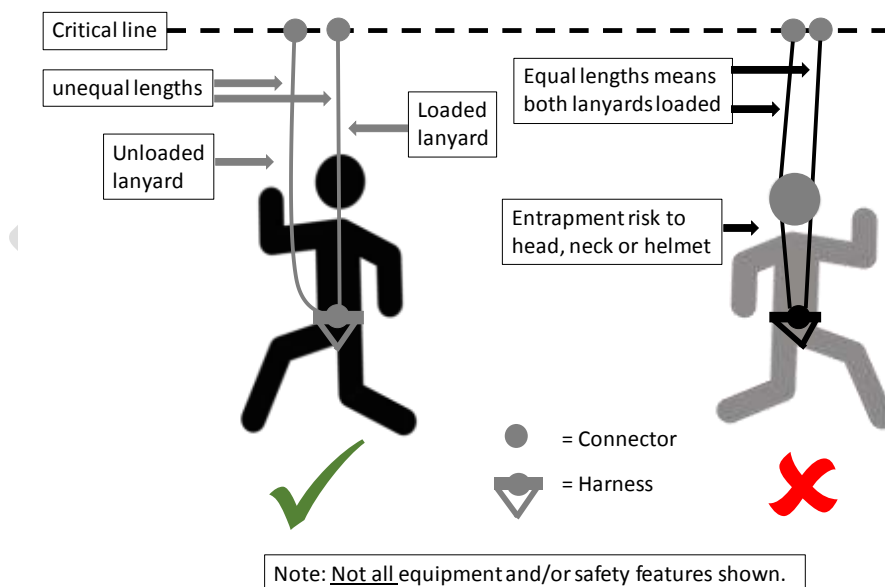


Diagram 1-A

Diagram 1-B

Diagram 1 – Lanyards to be of unequal length (diagram 1-A), as equal lengths can create an entrapment hazard (diagram 1-B).

The effective minimum difference in length between the two unequal lanyards *must* be sufficient to alleviate the risk of entrapment.

A6.1.2 Sufficient gap between lanyards

Where two unequal length lanyards are not used there *must* be sufficient gap between the two lanyards when loaded to avoid possible entrapment. A 'rigid spreader' may be able to achieve this.

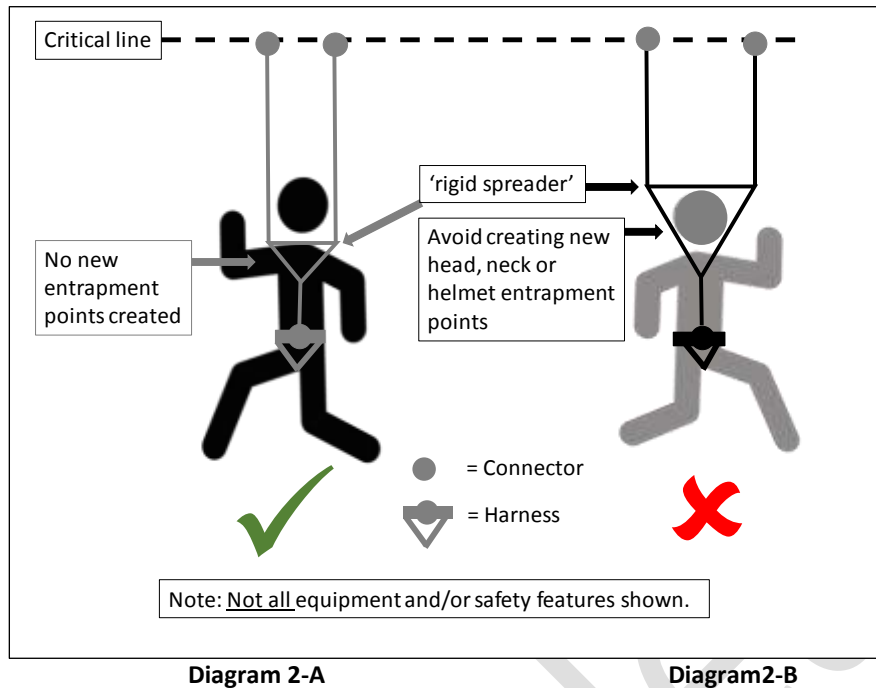


Diagram 2 – The 'rigid spreader' avoids the risk of entrapment (Diagram 2-A) but the design needs to avoid creating possible new entrapment hazards (diagram 2-B).

Where a spreader is used:

- the system *must* not create other entrapment hazards
- the minimum spreader distance *must* be sufficient to alleviate the risk of entrapment
- the spreader *must* be of an appropriate design and material to operate as intended
- the spreader *must* have a safe working load suitable for the task.

A6.3 Single piece or sheathed lanyards

Self-belay systems with lanyards *must* minimise possible user entrapment and pressure on the neck, head and/or helmet that may cause strangulation when loaded, by having each separate lanyard constructed so it forms a 'single piece' of material that does not form a loop that creates an entrapment hazard.

All lanyards *must* be either a 'single piece' OR appropriately sheathed.

(Continued next page.)

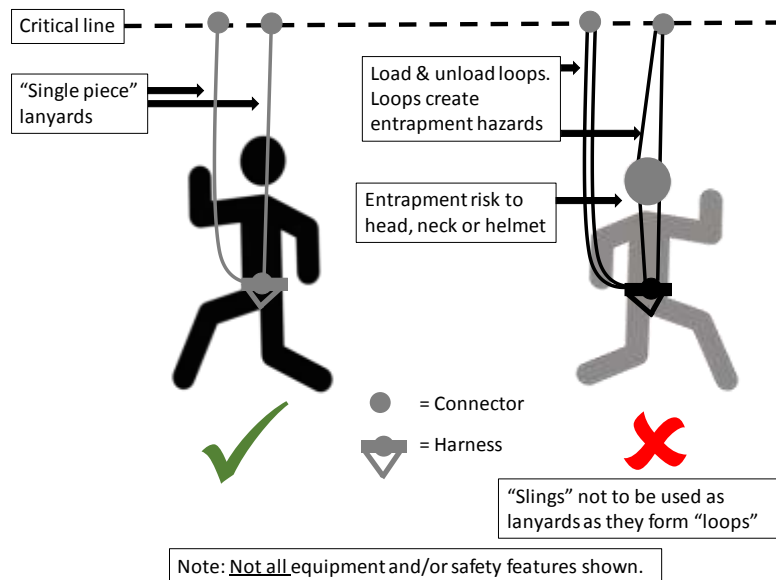


Diagram 3-A

Diagram 3-B

Diagram 3 – Each lanyard to be made so are a “single piece” of material (diagram 3-A) so that they do not form “loops” that can create entrapment hazards (3-B).

Multiple “strands” of a lanyard need to be appropriately sheathed to create a “single piece” (*e.g. interlocking device lanyards being appropriately sheathed to prevent individual components creating a ‘loop entrapment hazard’*).

Appendix 7 Weather warnings

The following table details the:

- current Australian weather warnings
- associated weather for each warning
- mainland warning trigger points for issuing warnings for strong winds and hail.

Bureau of Meteorology weather warnings and associated weather Table:

Severe Weather Warning	Severe Thunderstorm Warning	Marine Wind Warning	Tropical Cyclone Advice: Watch or Warning
High tides			
Large surf			
Blizzards			
Heavy rain/flash flooding	Heavy rain/flash flooding		
Strong winds Wind >63 km/h Gusts >90 km/h	Strong winds Gusts >90 km/h	Strong winds Wind >48 km/h or >26 knots	Strong winds Wind >62 km/h or >=34 knots
	Tornadoes		
	Hail (>=2cm)		
	Lightning		

The Bureau of Meteorology also provides a range of services. Information can be found at:

<http://www.bom.gov.au/weather-services/WeatherGuideLand.pdf>

Appendix 8 Challenge course supervision plan

Also refer to the leadership section [7.3.1 Supervision plans](#).

The following information provides an indication as what *may* be included in a challenge course supervision plan.

A8.1 Course diagram for visual reference

A course diagram or map provides a visual reference aid.

The diagram *should* include:

- a map – a visual representation that maps the site, course elements and other important locations. (While not necessarily drawn to an exact scale, it *should* appropriately reflect the relative proportions & distances, so it is not misleading regarding scale or location)
- element identification – an individual identification for each separate element and if needed a key matching the element type/name to the element identification on the diagram
- designated area(s) – location of any designated area(s) (*e.g. activity leader supervision locations, restricted areas, helmet use areas*)
- emergency plan locations – areas related to emergency plan (*e.g. rescue equipment locations, first aid kit locations, emergency communication locations, evacuation routes & exits, emergency mustering points*).

A8.2 Supervision and use

Information recorded in the plan for each individual element *should* include:

- a summary of the risks identified in the risk assessment
- supervision requirements for the element(s) including:
 - the level of supervision needed (*e.g. level 1, 2 or 3*)
 - the number of *active participants* an *activity leader* can supervise at one time (*e.g. supervision ratio, maximum number of active participants*)
- obstructions and/or conditions that may impact line of sight supervision and procedures to address them
- any variation in supervision required depending on *participant* considerations
- any variation in supervision required depending on equipment considerations (*e.g. if different connector types are use like individual screw gate carabiners vs an interlocking device*)
- relevant manufacturers specifications or requirements including but not limited to:
 - maximum number of climbers on the element at one time
 - recommended supervision
 - reference to any provided standard operating procedure(s)
- any standard operating procedure(s) (SOP) required to use the element – either by including the SOP as an appendix or referencing to where the SOP can be found
- any special *competencies* required by an *activity leader* to supervise the *element*
- any training, induction or confirmation of competence required before *activity leaders* supervise the *element*
- *activity leader* roles and/or specific individuals authorised to:
 - conduct training, induction in use of an element
 - supervise the element.

Information recorded in the plan for when multiple elements are in use at the same time *should* include:

- supervision requirements for the various elements when used at the same time
- where necessary specific location(s) to operate supervision from
- any standard operating procedures:
 - For example, any limitations as to the use of various elements (*e.g. due to lack of line of sight some elements cannot be used in certain situations*)
 - Sequencing and progression through the elements

- any relevant manufacturers specifications or requirements (see above)
- any activity leader requirements (see above)

Obstructions and/or conditions that may impact supervision visibility *may* include but is not limited to:

- trees and branches
- structures and equipment
- sun locations at certain times
- low light levels
- weather events (*e.g. rain, fog, overcast etc.*)

A8.3 Activity leader roles and competencies

The *activity leader* roles and *competencies* section in the plan *should* include:

- what the *competencies* required are for each role
- the responsibilities of each role
- any limitations place on a role (*e.g. if able to operate/supervise an element or if they require any supervision while undertaking the role*)
- requirements for confirm someone is competent to undertake a role.

A8.4 Communications plan

Information in the communications plan *should* include:

- any pre-activity information that needs to be supplied
- any information that is required during the activity
- communication standard operating procedures between *activity leaders* to maintain the required level of supervision.

A8.5 Emergency response plan

The emergency response plan *should* be included or if separate, referencing to where it can be found.

Appendix 9 Activity leader competencies

The following table outlines the recommended *competencies activity leaders should have* when leading challenge courses.

Instructor Units describing skills and knowledge	Code (or equivalent)	Supervisor Units describing skills and knowledge	Code (or equivalent)	Manager Units describing skills and knowledge	Code (or equivalent)
Common challenge course units					
Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A
		Plan for minimal environmental impact	SISOOPS304A	Plan for minimal environmental impact	SISOOPS304A
Low elements/ Adventure games					
All units listed in Core GPG, all common challenge course units plus		All units listed in Core GPG, all common challenge course units plus		All units listed in Core GPG, all common challenge course units plus	
Conduct a low ropes session	SISOCR301A	Conduct a low ropes session	SISOCR301A	Conduct a low ropes session	SISOCR301A
		Supervise a low ropes session	SISOCR403A	Supervise a low ropes session	SISOCR403A
		Manage risk in an outdoor activity	SISOODR404A	Manage risk in an outdoor activity	SISOODR404A
		Coordinate emergency responses	SISXEMR402A	Coordinate emergency responses	SISXEMR402A
				Manage a low ropes course	SISOCR505A
High elements					
All units listed in Core GPG, all common challenge course units plus		All units listed in Core GPG, all common challenge course units plus		All units listed in Core GPG, all common challenge course units plus	
Conduct a high ropes session	SISOCR302A [Note: has limited rescue skills]	Conduct a high ropes session	SISOCR302A [Note: has limited rescue skills]	Conduct a high ropes session	SISOCR302A [Note: has limited rescue skills]
		Supervise a high ropes session	SISOCR404A [Note: has advanced rescue skills]	Supervise a high ropes session	SISOCR404A [Note: has advanced rescue skills]
		Manage risk in an outdoor activity	SISOODR404A	Manage risk in an outdoor activity	SISOODR404A
		Coordinate emergency responses	SISXEMR402A	Coordinate emergency responses	SISXEMR402A
		Implement and monitor occupational health and safety policies	SISXOHS402A	Implement and monitor occupational health and safety policies	SISXOHS402A
				Manage a high ropes course	SISOCR506A

(Table continued next page.)

Instructor Units describing skills and knowledge	Code (or equivalent)	Supervisor Units describing skills and knowledge	Code (or equivalent)	Manager Units describing skills and knowledge	Code (or equivalent)
Facilitation skills					
Assist in the facilitation of adventure-based learning activities	SISOABL301A	Assist in the facilitation of adventure-based learning activities	SISOABL301A	Assist in the facilitation of adventure-based learning activities	SISOABL301A
		Facilitate adventure-based learning activities	SISOABL402A	Facilitate adventure-based learning activities	SISOABL402A

Notes:

- Where a *collective belay* uses deep water, rescue competencies need to meet those appropriate to the site and required under 'pool safety' legislation or regulation of the relevant jurisdiction the activity operates in.
- Refer to *Abseiling and Climbing GPG* for:
 - Bouldering on natural or artificial surfaces*
 - Abseiling and climbing elements on natural or artificial surfaces.*

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