Slacklining and Highlining

Australian Adventure Activity Good Practice Code

Guidelines for Slacklining and Highlining in natural and artificial environments

Australian Slacklining Association

Contents Overview

Copyright

Introduction

About these standards

*These standards have been developed independently to work seamlessly with The Australian Adventure Activity Standards (AAS). The AAS are a voluntary best-practice framework for safe and responsible planning and delivery of outdoor adventure **activities** with **dependent participants**.*

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

Do these standards apply to me?

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

Refer to Part I – Core Standard for additional information.

Are these standards legally binding?

They are voluntary, not legal requirements. However, they do frequently refer to specific laws and regulations which are legally binding.

*Some **land managers** and other organisations may require compliance as a condition of obtaining a licence, permit or other permission.*

Refer to Part I – Core Standard for additional information.

Structure and interpretation of the standards

*Part I of these standards includes guidance that applies to all adventure **activities**. It sets out a common approach to risk management that applies irrespective of the specific **activity** being undertaken. Part II includes guidance on specific adventure **activities**. For any given **activity**, both Part I and the relevant section of Part II that applies to that specific **activity** should be consulted.*

*The standards cover only those **activities** specifically listed in Part II. While Part 1 of the standards may be useful in managing **risk** generally for other activities, they may not reflect best practice for such other activities.*

The following key words occur frequently throughout the standards:

> ***Shall**: used where a provision is mandatory, if the **provider** is operating fully in accordance with the standards.*
>
> ***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:

Operative provisions are in normal roman text.

"Key words" are in ***bold blue underline***.

Defined words are in **bold.** A full list of definitions is in the Glossary.

Background information or discussion is in *italics.*

Examples are in *orange italics.*

In document references are in underlined green. References to other parts of this document are by section heading title. External references are in plain green.

Disclaimer

All reasonable attempts have been made to ensure these standards are accurate, relevant and current at the date of publication. Nevertheless, the standards are only advisory and general in nature, and may not be suitable for all contexts.

*They are recommendations for voluntary application by adventure activity **providers**. They are not directly binding on any person or organisation and have no direct legal force.*

*The Australian AAS will not cover each and every circumstance of an adventure **activity**. Even when they are adhered to, they cannot entirely eliminate the **risk** or possibility of loss or injury.*

This publication and the information it contains is made available on the express condition that the publisher, together with the authors, consultants and advisers who have assisted in compiling and drafting this publication and the Australian AAS:

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- *to the maximum extent permitted by law, disclaim all liability and responsibility for any direct or indirect loss, damage or liability which may be suffered or incurred by any person as a consequence of reliance upon anything contained in or omitted from this publication.*

Creation

These standards were developed with the input from a wide range of outdoors and adventure activity experts with extensive field experience. They draw heavily 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. Major credit is given to the Australian Adventure Activity Standards, the framework of which this document has adopted.

Further details of the creation of the Australian AAS can be found at www.australianaas.org.

It is intended that the standards will be regularly updated to reflect changing practice and better understanding over time.

1.0 Activity

This document is to be used together with Part I – Core Standard.

1.1 Slacklining

Slacklining is the act of balancing, walking or running on a piece of webbing, usually 2.5-5cm wide between two points, only a short distance from the ground. Variants include **Longlining**, **Tricklining** and **Waterlining**

- **Longlining** can be defined as a slackline exceeding 30m in length.
- **Tricklining** is conducted on a highly tensioned 5cm wide line, where the trickliner uses the high potential energy to perform airborne tricks
- **Waterlining** can be slacklining, Longlining or tricklining over a body of water

1.2 Highlining

Highlining is slacklining performed at heights. Typically this is between natural surfaces however can also occur between artificial surfaces such as buildings or in gyms.

Consideration must be given to both the height of the line and correct rigging methods to allow for a safe **leashfall**.
If, in the unlikely event of a **mainline failure**, there is a risk that the participant will not be prevented from impacting the ground or an object, this is considered to be an incorrectly rigged highline.

1.3 Exclusions

Activities that are not covered by this AAS are:

- Challenge Ropes course activities
- Abseiling or climbing
- Climbing involving mountaineering and ice climbing
- Improvised roping activities during bushwalking on difficult or trackless terrain
- Activities associated with Camping while on overnight or extended activities.

1.4 Related activities

Slacklining and Highlining is also engaged in as a component of associated activities including **Climbing** or **Abseiling**. In these cases, the relevant associated AAS shall be used in conjunction with this AAS.

Challenge course activities - refer to Challenge Course activity standard.

Where **bushwalking** occurs to access Slacklining or Highlining sites, then the Bushwalking activity standard shall be complied with.

Where camping occurs associated with Slacklining or Highlining, the Camping activity standard shall be complied with.

Slacklining and Highlining Appendixes

Appendix 1 – Common equipment

Appendix 2 – Equipment standards

Appendix 3 – Equipment load ratings

Management of risk

2.0 Management of risk

Refer Part I - Core Standard Management of Risk provisions.

Planning

Also refer to Part I – Core Standard

Activity plans

3.1 Slackline & Highline activity plans

"Activity plan considerations **should** include **but are not limited to**:

- aims and objectives of activity
- participants involved including but not limited to:
    - group size
    - relevant items listed in participant sections
- environmental conditions
- the site environment including but not limited to:
    - the intended route to the site
    - the access to start & finish locations and throughout the activity
    - identifying site specific hazards and risks
    - surface type, stability and soundness of any features and anchors
    - length and height of the slackline including **no fall zones** and levelness of anchors
    - availability and features of waiting areas
    - relevant items listed in environment sections
- the equipment requirements including but not limited to:
    - the expected weight of equipment need to be carried
    - relevant items listed in equipment sections

Emergency management planning

3.2 Slackline & Highline emergency management planning

Also refer to Part I – Core Standard 'emergency management planning' section.

A non-participating contact **should** be used as part of the emergency management plan for all activities and **shall** be used if providing activities in **remote areas** or where there is only one **activity leader**.

Events [shall] be treated as an emergency where a person is hanging in a harness and is:

- unconscious or
- is unable to continue to climb their leash or progress back to the anchors for an extended period of time.

Emergency management plans [**shall**] include:

- 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.

The use of relevant rescue systems and procedures [**shall**] be practiced periodically.

Where there is only one **activity leader**, the emergency management plan [shall] have arrangements that allow participants an adequate and appropriate communication system if the leader becomes incapacitated.

Participants

Also refer to Part I – Core Standard

Pre-activity communication

4.1 Slackline & Highline information provided pre-activity

Pre-activity information **should** clearly communicate:

- expectations and activity conditions

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

4.2 Slackline & Highline 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 approach
- building and maintaining positive relationships within the group
- reducing as much as practical any discomfort from the equipment used.

Environment

Also refer to Part I – Core Standard

Environment related planning

5.1 Slackline & Highline environment considerations

5.1.1 Natural surfaces

Any approved installation of permanent artificial anchors in natural surfaces **shall** be undertaken by appropriately **competent** person/s.

Any approved modification or removal of **natural surfaces** **shall** be undertaken by an appropriately **competent** person/s.

Safety considerations for **natural surfaces** [**should**] include **but are not limited to**:

- stability of the cliff face
- stability of features (*e.g. loose rocks*)
- availability of anchors or natural features to use for anchors

- safety requirements for access and egress including the likelihood of a fall from height before and after participation
- climatic conditions and weather events or conditions
- ability to retrieve equipment without dislodging or causing rockfalls.

5.1.2 Artificial surfaces

Permanent **artificial surfaces** constructed specifically for use in activities shall comply with relevant construction standards which may include but are not limited to:

- AS 2316.1—2009 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls
- 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
- EN 795: Personal fall protection equipment – anchor devices
- National Fire Protection Association (NFPA) standards

Temporary **artificial surfaces** 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.

Compliance with the AS 2316.1-2009 Australian Standard may include but is not limited to inspection, testing and maintenance requirements.

5.2 Slackline & Highline - severe weather

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	Coastal Waters 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		

5.2.1Slackline & Highline severe weather triggers

Trigger points shall be based on the relevant Bureau of Meteorology weather warnings and actual weather conditions.

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

- severe weather warnings
- severe thunderstorm warnings
- coastal waters wind warnings
- tropical cyclone advice: watch and warning
- extreme cold temperature
- extreme hot temperatures.

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

- cancellation of activity
- evacuating to a safe location
- avoid locations affected 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 Bushfire, prescribed fire and fire danger

Refer Core Standard section - Bush fire, prescribed fire and fire danger.

Water crossings and flooding

5.4 Slackline & Highline water and river crossings

Areas subject to current flood warnings should be avoided.

During severe weather or thunderstorms or when they are forecast, areas likely to experience flash flooding should be avoided.

Wildlife safety

5.5 Slackline & Highline wildlife safety

Procedures should be in place to minimise the risks associated with wildlife that may be encountered.

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

- bees
- ants
- hazardous plants *e.g. stinging nettle*
- nesting birds
- birds in flight
- snakes
- spiders
- wasps.

Considerations in reducing the above wildlife encounters may include but are not limited to:

- briefing participants in how to respond to encounters
- conducting a site assessment before use
- using alternative locations if necessary.

5.6 Environmental sustainability procedures

Environmental sustainability **procedures** may include but are not limited to:

- minimising the use of living trees used as anchors
- use of 'tree protectors' and/or wide tape slings when using living trees as anchors
- locate activity area and waiting areas to reduce repeated soil and root compaction around trees
- the use of temporary edge protection
- the installation of permanent artificial anchors or equipment only being carried out with the permission of the Land Owner or Land Manager and consistent with the Australian Highline Establishment and Fixed Anchor Guidelines
- use of geological features or artificial anchors where installed, in preference to living trees as anchors
- avoiding the modification of any natural surfaces or removal of natural features
- avoiding the removal of selected rock surface vegetation
- the modification of natural surfaces or removal of natural features only being carried out with the permission of the LandOwner or Land Manager
- the use of existing site access tracks wherever possible
- avoid using the edge of access tracks
- choosing sites wherever possible that have a rocky waiting area that can better tolerate groups
- choosing sites that are appropriate for the group size
- actively managing groups to minimise impact
- choosing shaded **waiting areas** so shade is not sought in inappropriate areas
- avoiding blocking access to other users with equipment
- negotiating with other users regarding shared use of a site
- selection of sites that enable getting on and off the slackline without causing unnecessary erosion
- use removable protection in a manner that avoids damage to and protects natural surfaces
- using permanent sewn backup connections or high quality fibre reinforced tapes to eliminate pollution due to broken tapes.

Also refer to the Core Standard – Environmental sustainability procedures.

Equipment and logistics

Also refer to Part I – Core Standard

6.1 Slackline & Highline equipment requirements

Procedures **shall** be in place to ensure appropriate clothing for the expected and foreseeable weather conditions.

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

Footwear **shall** be fit for purpose.

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

- Webbing
- Weblocks
- Webbing grab devices
- Leash rings
- Line rollers
- Soft Releases
- Line lockers
- Ratchets

- Static rope
- Slings
- Rope protection
- Carabiners
- Shackles
- Quicklinks
- Pulleys
- Lanyards
- Helmets
- Harnesses
- Accessory cord
- Artificial removable anchors including but not limited to chocks, cams, nuts, hexes, [keyhole/removable] bolt plates
- Artificial fixed anchors used in artificial climbing or abseiling structures
- Ascending devices
- Descending devices
- Dynamic rope
- Any other equipment that is part of the safety system used.

Appropriate vertical rescue equipment **shall** be readily accessible.

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

- kootenay rescue pulley
- capstan/riggers winch
- ascending devices
- belay device
- aid ladder
- hammock
- static hauling rope the length of half the longest highline
- knife
- compact pulley system
- prusik loops
- carabiners
- radios
- slings.

Where practicable, an additional rope long enough for half the longest **highline** **should** be considered for rescue purposes.

Procedures **shall** be in place to ensure a drinking water supply and first aid kit are available.

Example equipment lists can be found in appendix 1.

6.2 Slackline & Highline use of equipment

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

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

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

[Option A shown - also see M16-2 for options B & C]

An appropriate helmet [for protection from falling objects] **shall** be worn for

- all rigging activities on natural surfaces where there is a risk of falling objects or falls greater than a **FF1**
- all access to anchor locations where there is a risk of falling objects or falls greater than a **FF1**
- [on natural and artificial surfaces]
- [when in an area identified as requiring a helmet due to a falling objects risk].

Consideration shall be given to the increased danger of participants using a helmet while undertaking the activity of slacklining or highlining.

Considerations regarding the wearing of helmets [shall] include:

- The increased weight of a helmet leading to greater whiplash in the event of a backup fall
- The hazards associated with the additional distraction and discomfort
- The lack of hazardous surfaces or falling objects when the participant is in free space
- If spotters are employed during low slacklining, helmets should not be considered necessary

An appropriate harness shall be used.

6.2.1 Equipment loading

Equipment 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) shall have a suitable **Safety Factor** applied and a **Safe Working Load** (SWL) calculated.

Equipment with the **Stated Strength** providing the **Safe Working Load** (SWL) shall be loaded only to a maximum of the **Safe Working Load** (SWL).

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

The expected peak load and possible additional loads should a rescue be carried out shall be considered when determining equipment loading.

6.2.2 Connections

Connection methods, equipment and systems used shall be periodically reviewed.

Considerations when determining connect methods, equipment and systems [**should**] include but are not limited to:

- the type of anchor or anchors being used
- the redundancy available should an anchor fail
- what needs to be attached to the harness *e.g. direct connection to rope or a descender device*
- the experience and context of who is completing the connection of the rope to the harness or descender device
- the availability of a **competent** person to supervise or check the connection that is completed by a participant.

6.2.3 Connectors – practices relating to use

Carabiners shall be used so that no load is intentionally across the (minor axis) gate. This means that carabiners are NEVER to be used as a connection to a highline when a fall factor greater than 1 (FF1) can be expected

Systems that have cyclical loads constantly applied or subject to vibration should be inspected at an appropriate frequency.

The type of connector used [shall] be suitable for the task.

The connection of the harness **shall** use either:

- two methods of connection to provide redundancy, with one or more points being a rethreaded knot or a locking connection.
- a 'three way' **auto-locking** carabiner where 'clipping in' is the sole means of attachment.

In situations where participants complete any connection to a harness:

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

6.2.4 Chest harnesses

Chest harnesses are only used in combination with a sit harness.

Consideration of the use of a combination chest and climbing sit harness or a full body harness should occur:

- when the security of a sit harness cannot be relied upon due to body shape
- 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*)
- very young participants.

6.2.5 Slings

Slings shall be used for the anchoring of slacklines and highlines in conjunction with or instead of static rope

Synthetic slings should be considered;

- when living trees are deemed an acceptable use
- only in conjunction with appropriate padding.
- Industrial lifting slings can be considered under certain circumstances to be acceptably 'padded' if judged to be so by a competent person and only when used with other 'redundant' backup means.
- on anchors of two or less points

6.2.6 Other equipment - use considerations

Dynamic rope shall only be used

- as the backup to very short highlines with adequate height and abrasion protection in place
- when lanyards (*e.g. 'cows tails'*) are used at or above anchor height.
- for the internal 'core' in leash construction

A procedure regarding participant supplied equipment should be developed.

Where a participant supplies any personal climbing or abseiling equipment, this shall comply with the above equipment requirements and equipment use sections and be serviceable.

Wearing gloves should be considered when crossing highlines by the means of a rolling device or for persons who are likely to experience many falls.

6.2.6 Rescue systems

Anchors and equipment should always be organized to accommodate a timely and effective rescue.

Considerations in rigging systems for rescue [shall] include but are not limited to:

- load direction
- load magnitude

- ability to lower the person
- ability to conduct sideways hauls
- ability to enable an **activity leader** to complete a **contact rescue**
- ability to raise the person.

Additionally rescue plans should be discussed with all capable activity leaders, this [**shall**] include **but is not limited to**:

- Anchor levelness
- Ledges and ease of access to the highline
- Lowerable areas and ground topography
- Considerations for changeable weather

6.3 Slackline & Highline maintenance of equipment

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

All equipment **should** be inspected periodically so that it is serviceable.

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

All anchors on **artificial surfaces** used **should** be periodically inspected as per any relevant 'artificial surfaces' construction standard by an appropriately **competent** person.

Considerations for how regular the assessment of all anchors occurs **may** include **but are not limited to**:

- the characteristics of the site
- how many people use the site and how regularly
- any manufacturers' recommendations where relevant
- the equipment being used.

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

A record of inspection of anchors on **artificial surfaces** **shall** be maintained.

An equipment record **should** be maintained.

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

- item individual identifier
- date of manufacture
- 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
- extreme usage events or patterns (*e.g. impacts, 'catches'*)
- age
- years in service
- manufacturer's recommendations.

6.4 Slackline & Highline storage of equipment

Activity equipment shall 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 storage is free from interference of fauna or vermin.

Leadership

Also refer to Part I – Core Standard

Naming conventions

7.1 Slackline & Highline naming conventions

The activity leader naming convention enables this activity standard to be related to Part I – Core Standard requirements.

It is important to clarify specific roles and competencies required to avoid the possibility of:

- an "assistant guide" leading a group when "guide" **competencies** are required
- an "assistant guide" or "guide" leading a group when "instructor" **competencies** are required.

All activity leader competencies needed for a particular role shall be clearly defined.

An slacklining and/or highlining instructor, has the competence to instruct participants so that they may undertake the activity independently without supervision.

An slacklining and/or highlining guide, has the **competence** to lead participants throughout the whole activity.

An slacklining and/or highlining assistant guide, has some but not all of the **competencies** of an slacklining and/or highlining guide, so can only lead participants through part of the activity under **direct supervision** of a guide or instructor.

The leadership naming conventions are:

''Slacklining guide", ''Highlining guide", "Slacklining instructor" and "Highlining instructor" can be the equivalent to **Leader** in Part I – Core standard.

Competencies

*This section outlines the **competencies** that activity leaders should have.*

Competencies overview

*The Australian AAS 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 Part I – Core Standard Recognition of competence.*

7.2 Slackline & Highline competencies

Also refer to the competencies section in Part I - Core Standard.

For activities that also involve bushwalking to the site, refer to the Bushwalking activity standard.

For activities that also involve abseiling on natural surfaces refer to the Abseiling and Climbing activity standard

For activities that also involve climbing on natural surfaces refer to the Abseiling and Climbing activity standard

[Relevant rescue competencies [shall] be practiced periodically.]

Recognition of competence

Slackline & Highline recognition pathways

Refer to considerations for recognition pathways outlined in Part I - Core standard.

7.3 Supervision

Appropriate supervision shall be provided all times during the activity.

The number of participants permitted to actively participate in an activity shall be limited to the number the activity leaders can provide with **direct supervision** to deal with all aspects of the activity.

Spectators or participants currently **non-actively participating** should be located in a **waiting area** that reduces the likelihood:

- of a fall from height
- being struck from a falling object and/or
- they interfere with the conduct of the activity.

Spectators or participants currently **non-actively participating** should where necessary be supervised independently.

7.3.1 Slacklining and highlining group size

Considerations when determining group size shall include but are not limited to:

- 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 non-actively participating participants
- considerations for determining group size outlined in Part I – Core standard.

7.3.2 Recommended supervision

Considerations for determining supervision requirements may include but are not limited to:

- characteristics of the site
- the buddy check system

- participant training progression and competence
- supervision requirements of participants who are waiting
- time for the activity leaders to allow all participants to undertake the activity being sufficient and realistic
- general considerations for determining supervision requirements outlined in Part I – Core Standard.

The supervision requirements and ratios for programs that train/teach participants to become guides or instructors **should** be determined on a case-by-case basis, according to the progress of those participants towards being fully independent guides or instructors themselves.

7.3.3 Participants that are non-actively participating

Consideration **shall** be given to the type of supervision participants require when **non-actively participating** (i.e. who are waiting to undertake the activity).

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

The following supervision recommendations are based on participants who are **non-actively participating** are either:

- capable of self-managing their own safety in a **waiting area** based on instructions provided or
- are under the supervision of either another **activity leader** not providing direct supervision of the activity or a **responsible person**.

7.3.4 Slacklining supervision

Adequate supervision **shall** be provided for participants both actively and non-actively participating.

The number of participants that can be supervised while **slacklining** on natural or artificial surfaces **shall** be based on the:

- the **competence** of the **spotters**
- the ability and need for providing **direct supervision** or **indirect supervision** of both the participant(s) and **spotter(s)**
- the available distance separating multiple participants
- the site considerations including hazards within the **fall zone**.

7.3.5 Highlining supervision

Adequate supervision **shall** be provided for participants both actively and non-actively participating.

Unless the slackliners are assessed for **competence** they **should** be considered dependent participants and suitable supervision as recommended below is used.

Recommended supervision for participants actively highlining;

- **top-rope** with multiple short highlines in close proximity to each other:
    - 1 x highlining guide/instructor to maximum of 2x highlines in use
    - 1 x highlining guide/instructor and 1 assistant guide to maximum of 3x highlines in use.
- **Lower leash** with multiple short highlines in close proximity to each other:
    - 1 x highlining guide/instructor to maximum of 2x highlines in use
    - 1 x highlining guide/instructor and 1 assistant guide to maximum of 3x highlines in use.
- **Lower leash** with multiple long highlines in close proximity to each other:
    - 1 x highlining guide/instructor to maximum of 1x highlines in use
    - 1 x highlining guide/instructor and 1 assistant guide to maximum of 2x highlines in use.

Short highlines can be defined as under 30m in length

Long highlines can be defined as over 60m in length
It is the responsibility of the instructor to assess how much supervision is required on medium length lines (>30m, <60m).
See 6.2.6 Rescue systems and 7.3.1 Slacklining and highlining group size for relevant assessment criteria.
Top-rope safety systems should not be used on highlines exceeding 30m in length.

7.4 During activity

7.4.1 Knowledge of site

The knowledge and experience 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 Activity information provided to participants

The information required **shall** be determined prior to the activity.

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

Opportunities for participants to ask questions and have concerns addressed **shall** be provided.

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

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

- the plan for running the activity
- who is controlling the activity and who to ask for guidance
- relevant participant responsibilities
- site specific hazards and risks
- the correct fitting of personal equipment and this is to be checked before use
- the correct use of the fall protection systems
- the correct use of the activity's systems
- an appropriate technique(s) for the activity
- communications systems and requirements
- any other relevant activity information or procedures.

Slacklining and Highlining specific activity information

Activity information that **should** be provided to participants Slacklining and Highlining includes **but is not limited to**:

- the activity information listed above
- method for "falling off" and "recovering to the line"
- procedures for climbing the leash and traversing the line back to the start with a **line roller** device.

7.4.3 Falling objects

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

- checking the site and anchors prior to use
- ensuring helmets are worn where relevant as per the equipment section
- designating **waiting areas** that reduce the expose 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 fall areas is minimised
- minimising movement between areas that are located above other people
- supervision of participants while they are located above other people.

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

- where allowed, remove loose objects that are likely to fall prior to running the activity
- managing spectators and other people moving through the area.

7.4.4 Falls from height

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

- how close to the edge people are
- the slope of the surface being stood on
- 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 shall include checking participant(s):

- equipment is correctly fitted before they need to rely on the **leash system**
- correct attachment to the **leash system**, abseil system and/or other safety systems.

Checking equipment and attachment shall not be delegated to the participants themselves, unless they have demonstrated **competence** in the procedure(s).

To reduce the potential for [and/or severity of] falls from height, procedures shall include:

- ensuring anywhere a fall can be taken is safe a free from objects underneath or to the side
- remove unnecessary slack in the leash before use
- monitoring the correct use of the leash
- monitor the tension of the webbing to encourage maximum stretch characteristics
- providing appropriate instruction to mitigate risks caused by falling on very steep sections of webbing or **split connections**
- monitor excessive backup twisting or wrapping on mainline

To reduce the potential for [and/or severity of] 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 a safety system
- checking participant's equipment is correctly fitted before they need to rely on the **leash**
- checking correct attachment to the **leash**, safety or other systems
- Utilising **split connections** for line longer than 100m or where the direct height is not adequate to catch a **backup fall**

Consideration shall be given to the need for **no fall zones**, where the leash is not to be relied upon as the primary means of safety and a shorter tether, usually a line roller must be used

7.4.5 Entanglement and snags

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

To avoid entanglement in ropes and devices:

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

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

- rings should be removed or taped over

- body piercings should be removed or taped over.

7.4.6 Anchors and the belay systems

Anchors shall be sufficient to protect a fall and escape from a highline during high wind

Procedures to ensure that all systems function as intended shall include but are not limited to:

- anchor systems are assessed as suitable to support the intended loads
- 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 to and disconnection from the system during the activity.

Where a **top rope leash system** requires a **belayer**, either the belayer shall be:

- a **competent** belayer; or
- under **direct supervision** of an activity leader.

Also refer to equipment section – Rescue systems

7.4.7 Top rope leash systems (<30m)

Considerations for top rope leash systems [**should**] include but are not limited to:

- utilising low stretch webbing and low stretch top rope line, ideally the same stretch characteristics as the webbing for the highline
- the use of a twin tensioned safety line or a leash to both the upper line (top rope leash system) and another leash to the lower line (highline)
- a belay system that can move the top rope leash along the system
- rigging the top rope leash system an adequate height above the participant
- appropriate communication systems to enable effective communication between the participant and the activity leader
- the time the participant will spend on the highline and the expected weather forecast
- the competency of the participant and their general fitness and endurance
- dehydration due to excessive heat
- the time the participant may be suspended in a harness while awaiting rescue
- if **A-Frames** or **Hang Frames** are utilised that they be securely anchored down via redundant means

Additional pre-activity information should include but is not limited to the method of transferring from the activity top rope leash system to a fixed anchor and back to the activity top rope leash system.

7.4.8 Short highlines (<30m)

Considerations for short highlines [should] include but are not limited to:

- utilising only high stretch webbing with an adequate **MBS**
- if appropriate, the use of dynamic or static rope for as a backup
- appropriate communication systems to enable effective communication between the participant and the activity leader
- the time the participant will spend on the highline and the expected weather forecast
- the competency of the participant and their general fitness and endurance
- dehydration due to excessive heat
- the time the participant may be suspended in a harness while awaiting rescue

7.4.9 Long highlines (>60m)

Considerations for longer highlines [should] include but are not limited to:

- The use of mid - low stretch webbing for ease of walking and rescues
- the use of webbing as a backup only
- strong fibre reinforced tapes or sewn connections between mainline and backup webbings
- appropriate communication systems to enable effective communication between the participant and the activity leader
- the time the participant will spend on the highline and the expected weather forecast
- the competency of the participant and their general fitness and endurance
- dehydration due to excessive heat
- the time the participant may be suspended in a harness while awaiting rescue
- strategies to manage the varying steepness on the line during rolling or rescues

- the **competence** in using basic skills to temporarily operate out of line of sight or communication of an activity leader.

- incorporate the use of **split connections** to minimise the fall in the event of a **mainline** failure

7.4.10 Alternate rigging techniques

Alternate rigging techniques should be considered as a method to improve safety when slacklining and highlining. Only suitably qualified and competent activity leaders, or assistant leaders under direct supervision should incorporate the use of alternative techniques. These include but are not limited to;

- **A frames** or **Hang frames**
    - four suitably strong and redundant means of anchoring A-frames must be used whenever a risk of their failure could cause damage to any other part of the system and/or their failure leads to a potential unexpected impact with the ground (longlining, tricklining, waterlining)
- **Space lines** or **spacenets**
    - site selection is extremely important when allowing the consideration of one leg failing, this includes load shifts and peaks along with the potential abrasion issues associated.
    - suitable anchor **MBS** and line strengths must be considered when allowing multiple participants onto the line/s. A **WLL** must be defined one the rigging is completed and should be adhered to at all times. Only suitably qualified and competent persons can define the **WLL** of a spaceline/net system
    - a top rope safety system should be considered for high up spacelines
    - spacelines in a park or low to the ground must also be rigged redundantly
- Hammocks on a highline
    - methods of attachment should be secure as to avoid any sliding or movement that could damage the **mainline**

A pre-activity check and ongoing monitoring shall be used to confirm that the activity is safe to continue using the pre rigged gear.

Participants should have experience in checking and assessing anchors and do so before every use.

7.4.11 Activity leader fatigue and repetition

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.

7.4.12 Activity leader positioning

The activity leader should, where practicable, have visual contact with the slackliner(s) and/or highliner(s).

An activity leader with the appropriate rescue competencies shall be positioned to affect a timely rescue if required.

7.4.13 Communication

A system of clear & unambiguous verbal or non-verbal communications shall be used to manage the activity.

Having line of sight and communication by sound should be used as the preferred means of supervising participants wherever possible.

7.4.14 Participants belaying or spotting

Considerations for when participants operate **belay systems** for **top rope leash systems** or **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
    - equipment is used correctly
- can appropriately communicate with the slackliner or highliner
- backup systems to support the belayer (*e.g. backup belayer*).

7.4.15 Slacklining

Safety considerations specifically when slacklining [should] include but are not limited to:

- the hazards within the fall zones
- the possibility of falling objects such as tree branches
- the length and tension of the webbing
- the height above ground near the anchors
- the slipperiness of the webbing
- the body orientations of the persons slacklining
- the need for **spotting**
- possible use of padding to protect from hazards in the **fall zone** and/or hard landings
- the supervision required.

Spotting should be used while participants are **slacklining** on non padded surfaces.

Where participants are spotting they shall be instructed and appropriately supervised.

7.4.16 Single activity leader working independently

When a single **activity leader** working independently requires a **belayer** and relies on **dependent participants** to belay them, additional procedures that should be considered include:

- assessment of the participants **competence** to operate the **belay system**
- the use of a backup **belayer**
- appropriate selection of the access route difficulty to minimise the possibility of the **activity leader** falling while climbing.

Glossary

G1.0 Slackline & Highline glossary

Abseiling: descending vertical or near vertical **natural surfaces** or **artificial surfaces** using ropes and descending friction devices to manage the descent. It is also known as rappelling.

Anchor: Any load bearing attachment to which any part of a **slackline**, **highline** or **belay system** is attached.

Anchor system: a group of individual **anchor**s to which any part of the **slackline**, **highline** or **belay system** is attached.

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.

Belay System: The means by which the **rigger** or activity leader is protected from an uncontrolled fall or descent.

Backup line: the secondary webbing or rope (typically slack) that hangs beneath the **Mainline** in a **highline** system.

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

Buddy Check: The process of having your tie in checked by a competent person. Applies to highlining.

Bushwalking: walking in natural areas.

Catching: The act of catching the **webbing** when falling on a **highline**, instead of taking a **leash fall**

Carabiner: (refer connector).

Camping: the use of a temporary site for overnight camping.

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.
- **Locking**: a connector that can be manually locked and unlocked to reduce the possibility of it opening
- **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.

Climbing: ascending, traversing or descending vertical or near vertical **natural surfaces** or **artificial surfaces**.

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**.)

De-tension: removing tension from the slackline system, can be done with a soft release or pulley system.

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 height: The vertical distance between the slackliner's or highliner's lowest body element and the surface beneath.

Fall zone: any surface that can be hit by a slackliner or highliner when falling.

Far side: describing the far side of a **highline** or **slackline**, also known as static side. See also **Near side.**

Feature: a part of a **natural surface** or **artificial surface**.

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

Harness: Climbing harness used for highlining

Highlining: slacklining at heights (also see **Slacklining**).

Line Grip: Used to grip the **webbing** to apply and release **tension**, also can be used to attach hammocks to **highline** and prevent sliding on the **webbing**.

Leash: the connection between the highliner and the **highline**, typically a **dynamic** or **static rope** threaded through tubular **webbing** for **redundancy**.

Leash fall: the process of falling during **highlining** in a manner that the fall is broken by the **leash**, as opposed to **catching**

Longlining: defined as a **slackline** exceeding 30m in length. Typically this requires higher tensions.

Leash rings: The connection between the **leash** and the **webbing**. Typically a round circle made from steel, aluminum or titanium.

Line tension: The tension on the webbing for a **slackline** or **highline.** This can either be standing tension (when nobody is on the line) or active tension (when somebody is on the line), see also **Peak force.**

Line Roller: a carabiner with ball bearings or wide pulley that allows its user to roll along the surface of the webbing

Main webbing: Used to describe the tensioned webbing in a **highline** system, the webbing that is walked on. The **backup line** sits underneath this and has less tension on it. Also see **Webbing**.

Main Line Failure: an incident involving damage to the main webbing so severe it causes complete failure. This scenario is incredibly rare and has never happened without additional factors (E.g. extreme wind, abrasion from rocks, incorrect use of gear).

Master Anchor Point: (also known as Focal or Power Point) The main connection point of an **anchor** constructed from multiple anchors or pieces of protection providing increased security through redundancy.

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).

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

Near side: describing the starting side of a **highline** or **slackline**, otherwise known as tension side, the side easiest to apply tension to the **webbing.** Also see **Far Side.**

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

No Fall Zone: designated areas of a **highline** or **slackline** that are only safe to traverse past when attached via means shorter than the leash

Primitive System: a type of tensioning and release system used to attach a **slackline** with **carabiners** and locking rings. As opposed to using a ratchet, or **weblock** and pulley system. Typically used for 25 and 20mm wide lines.

Peak Force: The highest force that is either measured or expected to be measured depending on the **slackline** or **highline** rigged.

Redundant: a system with more than one single point of failure.

Rigger: the person/s responsible for constructing, checking, managing and/or disassembling the **anchor** or **anchor system**

Rig Check: having the rigging of the **slackline** and **highline** system (including **anchor systems**) checked by a competent person

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).

Slacklining: the act of balancing, walking or running on a piece of webbing, usually 2.5-5cm wide between two points, only a short distance from the ground. Variants include **Longlining**, **Tricklining** and **Waterlining**

Soft Release: A device used to hold tension in a system using friction, can then be released in a slow controlled manner by unwrapping the webbing, does not require a pulley system to de-tension the system

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.

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 manufacturer's literature. (Refer appendix 3 – equipment load ratings).

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**.)

Tensioning: applying tension to a slackline system.

Top rope leash system: a safety system whereby participants are attached to an overhead line. This prevents excessive fall distance and forces and allows quicker rescues, ideal for beginners but impractical/impossible for highlines/slacklines longer than 30m

Tricklining: conducted on a highly tensioned 5cm wide line, where the trickliner uses the high potential energy to perform airborne tricks

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.

Waterlining: slacklining, Longlining or **tricklining** over a body of water

Webbing: a woven tape typically constructed from nylon, polyester or uhmwpe yarns to a width between 20mm and 50mm, most commonly 25mm.

Web Lock: Engineered equipment used to attach the end of the webbing to the anchors. Can also use sewn loops or a knot. Weblocks allow easier tensioning and also have less reduction in webbing strength than a knot or a **primitive system**.

Also, refer to terms and definitions from Part I - Core Standard.

Slackline & Highline Appendices

Appendix 1 – Activity guide competencies

There are a number of national and international courses and accreditations that can be used to gain a high level of ability for the means of guiding or instructing slacklining and/or highlining.

It should be noted that most of these competencies require that a certain level of experience is gained prior to their completion. Few qualifications are slackline and/or highline specific and those that are, cannot be considered, on their own, substitutes for extensive experience. It is with these points in mind that the Adventure Activity Standards for Slacklining and Highlining can at most encourage that all leaders **should** gain these competencies before taking on any guiding and/or instructing roles.

A1.1 Slacklining on natural surfaces competencies

The following table outlines the recommended level of competence activity leaders **should** have when leading **slacklining** on **natural surfaces**:

Activity type	Slacklining Assistant guide (Assistant Leader) Units describing skills and knowledge	Code (or equivalent)	Slacklining guide (Leader) Units describing skills and knowledge	Code (or equivalent)	Slacklining Instructor (Leader) Units describing skills and knowledge	Code (or equivalent)
Common Slacklining 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
			ISA Rigger Certification		ISA Instructor Certification	
Tricklining or Longlining						
	All units listed in Part I – Core Standard, all common Slacklining units plus		All units listed in Part I – Core Standard, all common Slacklining units plus		All units listed in Part I – Core Standard, all common Slacklining units plus	

	Must be under direct supervision of a slacklining guide and/or slacklining instructor		ISA Rigger Certification		ISA Instructor Certification	
			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
	Operate communicatio ns systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A
Waterlining (Natural water bodies)						
	All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus		All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus		All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus	
	Must be under direct supervision of a slacklining Instructor		Instruct water-based fitness activities	SISFFIT008	Instruct water-based fitness activities	SISFFIT008
					Instruct water safety and survival skills	SISCAQU009

A1.2 Slacklining on artificial surfaces competencies

The following table outlines the recommended level of competence activity leaders should have when leading **Slacklining** on **artificial surfaces**:

Activity type	**Slacklining Assistant guide (Assistant Leader) Units describing skills and knowledge**	**Code (or equivalent)**	**Slacklining guide (Leader) Units describing skills and knowledge**	**Code (or equivalent)**	**Slacklining Instructor (Leader) Units describing skills and knowledge**	**Code (or equivalent)**
Common Slacklining units						
	Operate communicatio ns systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A
			ISA Rigger Certification		ISA Instructor Certification	

Tricklining or Longlining						
	All units listed in Part I – Core Standard, all common Slacklining units plus		All units listed in Part I – Core Standard, all common Slacklining units plus		All units listed in Part I – Core Standard, all common Slacklining units plus	
	Must be under direct supervision of a slacklining guide and/or slacklining instructor		ISA Rigger Certification		ISA Instructor Certification	
			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
					ISA Rigger Certification	
					Fixed anchor installation and assessment course or equivalent	
Waterlining (Artificial swimming pools)						
	All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus		All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus		All units listed in Part I – Core Standard, all common slacklining units, all tricklining or longlining units plus	
	Must be under direct supervision of a slacklining Instructor		Instruct water-based fitness activities	SISFFIT008	Instruct water-based fitness activities	SISFFIT008
					Instruct water safety and survival skills	SISCAQU009

A1.3 Highlining natural surfaces competencies

The following table outlines the recommended level of competence activity leaders should have when leading **highlining** on **natural surfaces**:

Activity type	**Highlining Assistant guide (Assistant Leader) Units describing**	**Code (or equivalent)**	**Highlining guide (Leader) Units describing skills and knowledge**	**Code (or equivalent)**	**HighliningInstructor (Leader) Units describing skills and knowledge**	**Code (or equivalent)**

	skills and knowledge					
Common highlining units						
	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A
	Must be under direct supervision of a highlining instructor or guide		Plan for minimal environmental impact	SISOOPS304A	Plan for minimal environmental impact	SISOOPS304A
			ISA Rigger Certification		ISA Instructor Certification	
			Perform complex vertical rescues	SISOVTR402A	Perform complex vertical rescues	SISOVTR402A
			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	SISXOHS402
			Undertake risk analysis of activities	SISXRSK301A	Undertake risk analysis of activities	SISXRSK301A
			Manage risk in an outdoor activity	SISOODR404A	Manage risk in an outdoor activity	SISOODR404A
					More than 1500hrs and two years experience as a highlining guide	

A1.4 Highlining artificial surfaces competencies

The following table outlines the recommended level of competence activity leaders should have when leading **highlining** on **artificial surfaces**:

Activity type	**Highlining Assistant guide (Assistant Leader) Units describing skills and knowledge**	**Code (or equivalent)**	**Highlining guide (Leader) Units describing skills and knowledge**	**Code (or equivalent)**	**HighliningInstructor (Leader) Units describing skills and knowledge**	**Code (or equivalent)**
Common highlining units						
	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A	Operate communications systems and equipment	PUAOP013A
	Must be under direct supervision		Plan for minimal environmental impact	SISOOPS304A	Plan for minimal environmental impact	SISOOPS304A

	of a highlining instructor or guide					
			ISA Rigger Certification		ISA Instructor Certification	
			Perform complex vertical rescues	SISOVTR402A	Perform complex vertical rescues	SISOVTR402A
			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	SISXOHS402
			Undertake risk analysis of activities	SISXRSK301A	Undertake risk analysis of activities	SISXRSK301A

A1.5 Additional recommended competencies

There are a number of additional relevant qualifications and recognition should be given where crossovers exist. It is not always possible or practicable to attain these competencies in a timely manner and so alternatives shall be considered appropriate.

The following should be considered equivalent to the ISA rigger certification

- CPCCLRG4001 - Licence to perform rigging advanced level

- IRATA Rope Access Technician Level 3

- SPRAT Rope Access Technician Level 3

- Slackline Australia Instructor/Coach Certification

The following should be considered equivalent to the ISA Instructor Certification

- There is currently no accepted alternative to the ISA Instructor Certification

Appendix 2 - Equipment

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

Equipment used for slacklining and highlining **may** include **but is not limited to**:

Slacklining and Highlining specific equipment

- Abrasion padding
- Webbing
- Webbing locker
- Line roller/pulley
- Webbing grab device
- Pulleys
- Progress capture devices
- Connectors (Quicklinks, Shackles, Carabiners, etc)
- Ropes – static and dynamic as appropriate

- Slings
- Climbing cord
- Fixed artificial anchors
- Helmet
- Whistle (for communications or emergency)
- Rescue equipment

Slacklining specific equipment

Specific equipment for slacklining may include but is not limited to:

- Crash pads

Highlining specific equipment

Specific equipment for highlining may include but is not limited to:

- Harness
- belay device
- Leashes
- Capstan winch
- Ascending devices

Rescue equipment may include but is not limited to:

- Additional rope
- Kootenay Pulleys
- Ascenders
- Prusik loops
- Slings
- Climbing cord
- Carabiners
- Knife suitable for cutting ropes (preferably on a lanyard)

General equipment

Specific general equipment may include but is not limited to:

Emergency/rescue

- Documentation (see Part 1 – Core Standard 5.1 activity leader required documentation)
- Emergency communication equipment (see Part 1 – Core Standard 4 emergency communication)
- First aid kit in waterproof storage (see Part 1 – Core Standard - 6.3 first aid equipment and medication)
- A waterproof method of storing and carrying documentation and communications equipment
- Specific activity context equipment required
- Emergency shelter where appropriate for the context
- Emergency equipment to keep a patient warm (eg. 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”
- relevant maps and navigation information
- a waterproof method of storing and carrying maps and navigation information
- compass and/or other navigation aids g. GPS
- pen/pencil and blank writing paper
- watch or equipment suitable to tell and measure time for first aid purposes

- head torch and spare batteries
- 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

Group

- backpack to carry equipment
- trowel for toileting
- toilet paper
- hand sanitiser
- water purification 'system'
- repair kit
- food for duration plus spare
- rubbish bags
- multi-tool with knife
- sunscreen
- insect repellent
- first aid kit common content - Refer Part I - Core Standard

Multi- pitch activities

- small personal backpacks to carry personal equipment
- inter-group communication equipment (e.g. portable two-way radios)

Appendix 3 – Equipment & relevant standards

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 (AS2316.1—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)
- 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)
- Weblocks (ISA:51)
- Webbing (ISA:41)
- Webbing Grab (ISA:61)
- Leash (ISA:31)

List of relevant standards

AS/NZS

- 1353 Flat synthetic-webbing slings Product specification
- 1891 Industrial fall-arrest systems and devices
- 1891.4 Part 4: Selection, use and maintenance
- 2316.1—2009 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls.
- 2512 Methods of testing protective helmets
- 2512.1 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
- 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

ISA

- ISA:21 Highline System
- ISA:37 Highline Leash
- ISA:41 Highline Webbing
- ISA:51 Highline Webbing Locker
- ISA:61 Webbing Grab

Appendix 4 – Equipment load ratings

Proper understanding and use of equipment load ratings (**stated strength**) is needed to allow for an appropriate safety margin (**safety factor**) to be used. This ensures that equipment is never overloaded 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, damage 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 manufacturer, 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. 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.

Examples

Rope

Recreational slacklining or highlining webbing 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.

Webbing:

- 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).

Connectors

Recreational 'slacklining/highlining' 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.

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 valve 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.

Examples:

SWL 3.75kN force equals approximately 375kg load

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

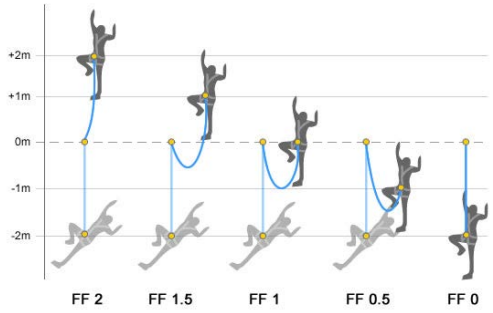
SWL 2,000kg load equals approximately 20kN force

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

New appendix 5 - 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).

Example https://www.ropebook.com/information/fall-factors/



Changes taken in
Main keywords: shall = requirement, should = recommendation

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