

EQUIPMENT GUIDELINES

DRAFT



Society of Professional Rope Access Technicians

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Notes for Use:

Use of the word ‘should’ denotes a recommendation. The word ‘should’ does not connote indifference or ambivalence regarding a statement.

Visit <https://sprat.org> for the most recent standards versions, supporting documentation, and news.



1. Purpose, Scope

1.1. Purpose

1.1.1. The purpose of this document is to provide impartial guidance for equipment commonly used in rope access systems and other fall protection systems.

1.1.2. This document is intended to be reviewed in conjunction with manufacturer instructions to assist selecting, inspecting, and using equipment in conformance with SPRAT standards.

1.2. Scope

1.2.1. The document provides:

1.2.1.1. Potential applications and features of equipment.

1.2.1.2. Selection, inspection, and use considerations for equipment.

1.2.2. This document is written for all persons associated with rope access and other work-at-height, including rope access program administrators, trainers, rope access supervisors, rope access technicians and other work team members.

2. Equipment Information

2.1. Applications

2.1.1. Common rope access or other work at height applications are provided for each category.

2.1.2. Equipment can be suitable for only select applications in a category.

2.2. Features

2.2.1. Common equipment features are provided for each category.

2.2.2. Suitable equipment for an application can have only certain features in a category.

2.3. Selection

2.3.1. Considerations to assist in ensuring compatibility with other equipment and suitability for a work environment are provided for each category.

2.3.2. SPRAT's [Presiding Regulatory Authority Reference](#) should be consulted to assist with presiding regulatory authority compliance.

2.4. Inspection and Use

2.4.1. Considerations to assist in ensuring that equipment is serviceable are provided in [Section 3](#).

2.4.1.1. Inspection considerations should be applied to equipment in each category, as applicable.

2.4.1.2. Equipment should be inspected, maintained, and removed from service in accordance with SPRAT's *Safe Practices for Rope Access Work*.

2.4.2. Considerations to assist in ensuring correct use of equipment are provided for each category.

2.5. Relevant standards

2.5.1. A list of voluntary consensus standards relevant to equipment of each category is provided.

2.5.1.1. Notes are included to assist in understanding standard classifications and equipment markings.

2.5.1.2. Determining the applicability of a standard is a requirement of a rope access program.

2.5.2. Additional relevant program and system standards are provided in [Appendix 1](#).

2.5.3. Withdrawn and superseded standards are provided in [Appendix 2](#).

3. Equipment Inspection

3.1. General Inspection Considerations

<input type="checkbox"/> Size or Capacity	<i>Suitability of equipment for user or forces that can be applied during use.</i>
<input type="checkbox"/> Age	<i>Equipment within lifespan as specified by manufacturer.</i>
<input type="checkbox"/> Storage	<i>Equipment stored in clean, dry, temperate area protected from UV exposure or other hazards.</i>
<input type="checkbox"/> Maintenance	<i>Equipment upkeep performed to ensure usability.</i>
<input type="checkbox"/> History	<i>Records of equipment use, inspection, or any required load or proof testing.</i>

3.2. General Indications of Potential Damage

<input type="checkbox"/> Visual indicators	<i>Features to indicate potential damage or need to remove equipment from service.</i>
<input type="checkbox"/> Missing or incorrect parts	<i>Absent components from manufacturing defect, modification, or damage.</i>
<input type="checkbox"/> Missing or illegible markings	<i>Worn or absent manufacturer information or tags.</i>
<input type="checkbox"/> Alteration	<i>Indication of unauthorized modification to equipment.</i>

3.3. Indications of Potential Damage to Hardware

<input type="checkbox"/> Burring	<i>Rough edges caused during manufacturing or repeated loading.</i>
<input type="checkbox"/> Cracks	<i>Material separation from excessive loading or corrosion.</i>
<input type="checkbox"/> Corrosion	<i>Oxidation of material from environmental or chemical exposure.</i>
<input type="checkbox"/> Deformation	<i>Bending, warping, or misalignment of components from inappropriate loading or impact.</i>
<input type="checkbox"/> Erosion or sharp edges	<i>Loss of material from frictional contact with environment, tools, or other equipment.</i>
<input type="checkbox"/> Gouges	<i>Dents or loss of material from impact with environment, tools, or other equipment.</i>
<input type="checkbox"/> Stress marks	<i>Indications of excessive or inappropriate loading.</i>

3.4. Indications of Potential Damage to Textiles and Plastics

<input type="checkbox"/> Abrasion	<i>Wear of material from frictional contact with environment, tools, or equipment.</i>
<input type="checkbox"/> Brittleness	<i>Flaking or breaking of material from aging, UV damage, or chemical exposure.</i>
<input type="checkbox"/> Burns	<i>Marks or holes from exposure to excessive heat.</i>
<input type="checkbox"/> Cuts	<i>Separation of material from contact with environment, tools, or equipment.</i>
<input type="checkbox"/> Elongation	<i>Stretch of material beyond manufacturer design from excessive loading.</i>
<input type="checkbox"/> Fading	<i>Loss of coloring from UV damage or chemical exposure.</i>
<input type="checkbox"/> Fraying	<i>Unraveling at material edges from contact with environment, tools, or equipment.</i>
<input type="checkbox"/> Glazing	<i>Superficial melting from frictional contact with environment, tools, or equipment.</i>
<input type="checkbox"/> Mildew	<i>Presence of mold from extended exposure to moisture.</i>
<input type="checkbox"/> Rigidity	<i>Loss of pliability from aging, UV damage, or chemical exposure.</i>
<input type="checkbox"/> Soiling	<i>Dirt or contamination that can affect functionality.</i>
<input type="checkbox"/> Stitching damage	<i>Abrasion, cuts, tears, or shifting of-stitching from environment, tools, equipment, or excessive loading.</i>

3.5. Inspection Considerations for Function

<input type="checkbox"/> Fasteners and moving parts	<i>Integrity of fasteners, ease of movement of springs, latches, levers, plates, etc.</i>
<input type="checkbox"/> Harness connection	<i>Harness attachment appropriate for application.</i>
<input type="checkbox"/> Component compatibility	<i>Anchorage, equipment, and other system components suitable for application.</i>
<input type="checkbox"/> Component orientation	<i>Equipment assembled and configured correctly for application.</i>
<input type="checkbox"/> Function test	<i>Test of equipment and system, protected by other system when necessary.</i>

4. General Equipment

4.1. Helmets

4.1.1. Applications

<input type="checkbox"/>	Overhead impact protection	<i>Is the helmet designed to protect against impact from overhead hazards?</i>
<input type="checkbox"/>	Side impact protection	<i>Is the helmet designed to protect against impact to the side of the head?</i>

4.1.2. Features

<input type="checkbox"/>	Energy absorption	<i>How is energy from impact dissipated (e.g., suspension straps, foam)?</i>
<input type="checkbox"/>	Chinstrap	<i>Does the helmet have a chinstrap?</i>
<input type="checkbox"/>	Adjusters	<i>What adjustments are available for fitting the helmet or chinstrap?</i>
<input type="checkbox"/>	Accessories	<i>Are there features for attaching accessories (e.g., headlamp, earmuffs, face shield)?</i>

4.1.3. Selection

<input type="checkbox"/>	Size	<i>Is the helmet the correct size for the individual?</i>
<input type="checkbox"/>	Equipment compatibility	<i>Is the helmet suitable for use with personal protective equipment or work equipment?</i>
<input type="checkbox"/>	Environment	<i>Is the helmet suitable for the work environment?</i>
<input type="checkbox"/>	Regulatory compliance	<i>Does the helmet satisfy presiding regulatory authority requirements?</i>

4.1.4. Inspection and Use

<input type="checkbox"/>	Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/>	Ease of inspection	<i>Are there stickers or paint that affect the ability to inspect the helmet?</i>
<input type="checkbox"/>	Impact protection	<i>Is the impact protection area clear of objects that can affect the function of the helmet?</i>
<input type="checkbox"/>	Fit	<i>Is the helmet fitted to the individual with the chinstrap adjusted?</i>

4.1.5. Standards

Standard	Year	Title	Notes
ANSI Z89.1	R2009	American National Standard for Industrial Head Protection	Type I: Top impact. Type II: Top and side impact. Class C: No electrical rating. Class G: 2.2 kV Class E: 20 kV
CSA Z94.1	2015	Industrial Protective Headwear – Performance, selection, care, and use	Type I: Top impact. Type II: Top and side impact. Class C: No electrical rating. Class G: 2.2 kV Class E: 20 kV
EN 397	2012	Industrial safety helmets	
EN12492	2012	Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods	
EN 14052	2012	High performance industrial helmets	
GB/T 38305	2019	Head protection – Rescue helmets	

4.2. Harnesses

4.2.1. Applications

<input type="checkbox"/> Rope access	<i>Body support within rope access systems.</i>
<input type="checkbox"/> Other fall protection	<i>Body support within travel restraint, positioning, and fall arrest systems.</i>

4.2.2. Features

<input type="checkbox"/> Style	<input type="checkbox"/> Y-style. <input type="checkbox"/> H-style. <input type="checkbox"/> Other.
<input type="checkbox"/> Attachments	What attachments are available on the harness? <input type="checkbox"/> Backup and other fall arrest systems (e.g., sternal, dorsal) <input type="checkbox"/> Main and other positioning systems (e.g., laterals used in pairs, ventral) <input type="checkbox"/> Travel restraint systems (e.g., ventral, rear waist) <input type="checkbox"/> Other.
<input type="checkbox"/> Fit	What adjustments are available on the harness? Are there buckles to be secured on the harness? Are the front or rear leg riser straps adjustable?
<input type="checkbox"/> Accessories	Are there designated locations for stowing energy absorbing lanyards? Are there tool loops on the harness? What is the strength of the tool loops? Are there additional features for attaching accessories (e.g., tool bag straps)?

4.2.3. Selection

<input type="checkbox"/> Capacity	<i>Is the harness suitable for user weight, including tools or other equipment?</i>
<input type="checkbox"/> Size	<i>Is the harness correct size for the individual?</i>
<input type="checkbox"/> Attachments	<i>Does the harness have attachments suitable for the application?</i>
<input type="checkbox"/> Environment	<i>Is the harness suitable for the work environment?</i>
<input type="checkbox"/> Regulatory compliance	<i>Does harness satisfy presiding regulatory authority requirements?</i>

4.2.4. Inspection and Use

<input type="checkbox"/> Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/> Fit	<input type="checkbox"/> Buckles fastened. <input type="checkbox"/> Waist belt, leg loops, and riser straps centered and tightened. <input type="checkbox"/> Dorsal attachment positioned correctly and chest strap tightened.
<input type="checkbox"/> Attachment compatibility	<i>Is each harness attachment suitable for the application of the attached system?</i>
<input type="checkbox"/> Stowing equipment	<i>Where is equipment stowed when not in use?</i>
<input type="checkbox"/> Rescue attachments	<i>What attachments are used on the rescuer or rescue subject harness during rescue?</i>

4.2.5. Standards

Standard	Year	Title	Notes
ANSI Z359.11	2021	Safety Requirements for Full Body Harnesses	
AS/NZS 1891.1	2020	Industrial Fall-Arrest Systems and Devices Part 1: Harnesses and ancillary equipment (5 amendments)	
CSA Z259.10	2018	Full Body Harness	Class A: Fall-arrest Class D: Suspension and controlled descent Class E: Limited-access Class L: Ladder-climbing Class P: Work-positioning Class R: Arc resistant
EN 361	2002	Personal protective equipment against falls from a height. Full body harnesses	
EN 12277	2015	Mountaineering equipment. Harnesses. Safety requirements and test methods	
ISO 10333-1	2016	Personal fall-arrest systems — Part 1: Full-body harnesses	
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	Class II: Sit harness (Waist only) Class III: Full-body

4.3. Connectors

4.3.1. Applications

<input type="checkbox"/>	System construction	Use within rope access and other fall protection systems, operations, and rescue.
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4.3.2. Features

<input type="checkbox"/>	Strength	What is the manufacturer reported strength of the connector? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Construction	What materials are used in construction of the connector (e.g., aluminum, steel)? What is the shape of the connector? Is there a feature to assist in ensuring appropriate loading of the connector?
<input type="checkbox"/>	Gate	What steps are required to open the gate? How is the gate sleeve locked and unlocked?

4.3.3. Selection

<input type="checkbox"/>	Capacity	Is the connector suitable for user weight, including tools and other equipment?
<input type="checkbox"/>	Equipment compatibility	Is the connector suitable for use with intended equipment?
<input type="checkbox"/>	Environment	Is the connector suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the connector satisfy presiding regulatory authority requirements?

4.3.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	Appropriate loading	What loading configurations are appropriate for the connector?

4.3.5. Standards

Standard	Year	Title	Notes
ANSI Z359.12	2019	Connecting Components for Personal Fall Arrest Systems	
CSA Z259.12	2016	Connecting components for personal fall–arrest systems (PFAS)	
EN 362	2004	Personal protective equipment against falls from a height. Connectors	B: basic connector M: multi-use connector T: termination connector A: anchor connector Q: screwlink connector
GB/T 23469	2009	Personal fall protection equipment – Connectors	
EN 12275	2013	Mountaineering equipment. Connectors. Safety requirements and test methods	
ISO 10333–5	2001	Personal fall–arrest systems — Part 5: Connectors with self–closing and self–locking gates	
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	T: ≥22 kN G: ≥40 kN

5. Rope Access Fundamental Equipment

5.1. Ropes and lanyards

5.1.1. Applications

- | | |
|--|--|
| <input type="checkbox"/> System construction | <i>Use within rope access systems and other fall protection systems, operations, and rescue.</i> |
|--|--|

5.1.2. Features

<input type="checkbox"/> Strength	<i>What is the manufacturer reported strength of the rope or lanyard? Is the reported value a failure strength or a factor of the failure strength?</i>
<input type="checkbox"/> Construction	<i>What is the construction type of the rope or lanyard? What materials are used in the rope or lanyard construction? What is the diameter of the rope or lanyard?</i>
<input type="checkbox"/> Elongation	<i>What values are provided by the manufacturer?</i>
<input type="checkbox"/> Termination	<i>How is the rope or lanyard terminated?</i>

5.1.3. Selection

<input type="checkbox"/> Capacity	<i>Is the rope or lanyard strength suitable for the configuration of the application? Has strength reduction from aging and knots (~30-50%) been considered?</i>
<input type="checkbox"/> Equipment compatibility	<i>Are the rope or lanyard features compatible for use with intended equipment?</i>
<input type="checkbox"/> Length	<i>Is the rope or lanyard an appropriate length for the application?</i>
<input type="checkbox"/> Environment	<i>Is the rope or lanyard construction suitable for the work environment?</i>
<input type="checkbox"/> Regulatory compliance	<i>Does the rope or lanyard satisfy presiding regulatory authority requirements?</i>

5.1.4. Inspection and Use

<input type="checkbox"/> Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/> Knots	<i>Are knots suitable for application, identifiable, and tightened by hand?</i>
<input type="checkbox"/> Equipment	<i>Is the rope or lanyard threaded through equipment correctly?</i>
<input type="checkbox"/> Protection	<i>Is the rope or lanyard sufficiently protected from hazards of the work method and work environment? See also Section 7.2 Protectors</i>

5.1.5. Standards

Standard	Year	Title	Notes
ANSI Z359.15	2014	Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest and Rescue Systems	
ANSI Z459.1	2021	Safety Requirements for Rope Access Systems	
CI 1801	2017	Low Stretch–Static Kernmantle Safety Rope	
CSA Z259.2.5	2012	Fall arresters and Vertical lifelines	
EN 1891	1998	Personal protective equipment for the prevention of falls from a height. Low stretch kernmantel ropes	Type A: 22 kN with terminations, 18kN without Type B: 15 kN with terminations, 12kN without
GB/T 23268.2		Specifications for protective equipments for sports. Part 2 Mountaineering climbing static rope and sling	
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	T: ≥ 20 kN G: ≥ 40 kN
See also Section 8.1 Positioning lanyards			

5.2. Backup Devices

5.2.1. Applications

<input type="checkbox"/>	Backup system	Use within rope access systems with focus of limited free fall potential, < 0.6 m (2 ft).
<input type="checkbox"/>	Fixed backup system	Use within backup systems for operations moving rope access technician or load.
<input type="checkbox"/>	Travel restraint system	Use within systems to eliminate risk of falling to lower level when working near edge.
<input type="checkbox"/>	Load limiting component	Use to assist in minimizing forces within systems (e.g., tensioned rope systems).

5.2.2. Features

<input type="checkbox"/>	Adjustment	Does the backup device self-trail along rope, or does it require manual adjustment? How does the backup device engage a rope?
<input type="checkbox"/>	One-way locking	Can the backup device movement be restricted to one direction?
<input type="checkbox"/>	Rope path protection	Is there a feature to hinder threading the backup device incorrectly?

5.2.3. Selection

<input type="checkbox"/>	Capacity	Is the backup device suitable for possible free fall potential of the user or load? Is the backup device suitable for rescue?
<input type="checkbox"/>	Lanyard assembly	What types and lengths of lanyard can be used? Does the backup device have specific connector requirements? Can the backup device be used when directly attached to a harness or fixed anchorage system?
<input type="checkbox"/>	Equipment compatibility	What rope constructions can be used with the backup device?
<input type="checkbox"/>	Clearance requirements	Have clearance requirements of the backup device been considered?
<input type="checkbox"/>	Environment	Is the backup device suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the backup device satisfy presiding regulatory authority requirements?

5.2.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	How is the backup device and system attached to the harness? What lanyard or energy absorber is used to attach the backup device to harness? How is drop potential of the backup device reduced? How is rope threaded through the backup device? Are there additional considerations when used as a fixed backup system?
<input type="checkbox"/>	Adjustment	How is the backup device handled to maintain effectiveness and minimize free fall potential? Are there additional considerations when used as a fixed backup system? Is rope managed to ensure unhindered maneuvers or operations?
<input type="checkbox"/>	Rescue use	Are there additional considerations when the backup device is used in rescue?

5.2.5. Standards

Standard	Year	Title	Notes
ANSI Z359.15	2014	Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest and Rescue Systems	
ANSI Z459.1	2021	Safety Requirements for Rope Access Systems	
AS/NZS 1891.4	2009	Industrial Fall-Arrest Systems and Devices Part 3: Fall-arrest devices	
CSA Z259.2.5	2012	Fall arresters and Vertical lifelines	
EN 353-2	2002	Personal protective equipment against falls from a height. Guided type fall arresters including a flexible anchor line	
EN 12841	2006	Personal fall protection Equipment-Rope access systems-Rope adjustment devices	Type A: safety line adjustment device ● EN 1891 Type A {rope} ● Other {rope} types or other constructions
GB/T 24537	2009	Personal fall protection equipment. Guided type fall arrester including a flexible anchor line	

5.3. Descenders

5.3.1. Applications

<input type="checkbox"/>	Main system	Use within rope access systems for descent, limited ascent, and positioning.
<input type="checkbox"/>	Raising/Lowering system	Use within rope access operations and rescue to move person or load.
<input type="checkbox"/>	Travel restraint system	Use within systems to eliminate risk of falling to lower level when working near edge.
<input type="checkbox"/>	Load limiting component	Use within systems to ensure acceptable forces in systems (e.g., tensioned rope systems).

5.3.2. Features

<input type="checkbox"/>	Adjustment	How is the amount of friction applied to the rope adjusted?
<input type="checkbox"/>	Rope path protection	Is there a feature to hinder threading the descender incorrectly? Is there a feature to hinder uncontrolled descent if the descender is threaded incorrectly?
<input type="checkbox"/>	Auto-stopping	Is there a feature to stop descent if user lets go of the descender and rope?
<input type="checkbox"/>	Auto-locking	Is there a feature to lock the descender if user lets go of the descender and rope?
<input type="checkbox"/>	Fail-safe	Is there a feature to reduce the possibility of uncontrolled descent? Is there a feature to override the fail-safe mechanisms?

5.3.3. Selection

<input type="checkbox"/>	Capacity	Is the descender suitable for the user or load? Is the descender suitable for use in rescue?
<input type="checkbox"/>	Equipment compatibility	What rope constructions can be used with the descender?
<input type="checkbox"/>	Environment	Is the descender suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the descender satisfy presiding regulatory authority requirements?

5.3.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	How is the descender and system attached to the harness? How is rope threaded through the descender? What are considerations for use in rope access operations?
<input type="checkbox"/>	Adjustment	How should the descender be handled when descending and ascending? How is the descender secured to prevent unintended movement? Is rope managed to ensure unhindered maneuvers or operations?
<input type="checkbox"/>	Rescue use	Are there additional considerations when the descender is used in rescue?

5.3.5. Standards

Standard	Year	Title	Notes
ANSI Z359.9	2021	Personal Equipment for Protection Against Falls – Descending Devices	Same as ISO 22159, No Type 2
CSA Z259.2.3	2010	Descending Devices	
EN 341	2011	Personal fall protection equipment. Descender devices for rescue	
EN 12841	2006	Personal fall protection Equipment–Rope access systems–Rope adjustment devices	Type C: working line descender ☉ EN 1891 Type A {rope} ● Other {rope} types or other constructions
EN 15151-1&2	2012	Mountaineering equipment - Braking devices Part 1: Braking devices with manually assisted locking, safety requirements and test methods Part 2: Manual braking devices, safety requirements and test methods	See also UIAA-129
GB/T 38230	2019	Personal fall protection equipment – Descender devices	
ISO 22159	2007	Personal equipment for protection against falls – Descending devices Type 1: automatic, integrated line Type 2: manual, integrated line Type 3: manual, mechanically variable friction, hands-free locking and panic locking Type 4: manual, mechanically variable friction, hands-free locking Type 5: manual, mechanically variable friction, non-automatic locking Type 6: manual, non-mechanically variable friction, non-automatic locking	Class A: $\leq 7,5 \times 10^6$ J Class B: $\leq 1,5 \times 10^6$ J Class C: $\leq 0,5 \times 10^6$ J Class D: one descent

5.4. Ascenders

5.4.1. Applications

<input type="checkbox"/>	Main system	Use within rope access systems for descent, limited descent, and positioning.
<input type="checkbox"/>	Raising system	Use within rope access operations and rescue to move person or load.

5.4.2. Features

<input type="checkbox"/>	Adjustment	How does the ascender engage the rope?
<input type="checkbox"/>	Attachments	What attachment locations are available on the ascender?

5.4.3. Selection

<input type="checkbox"/>	Capacity	Is the ascender suitable for user weight, including tools and other equipment?
<input type="checkbox"/>	Equipment compatibility	What rope constructions can be used with the ascender?
<input type="checkbox"/>	Environment	Is the ascender suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the ascender satisfy <i>presiding regulatory authority</i> requirements?

5.4.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	How is the ascender attached to the harness? What type and length of lanyard is used to attach the ascender to harness? How is drop potential of the ascender reduced? How is rope threaded through the ascender?
<input type="checkbox"/>	Adjustment	How should the ascender be handled when ascending and descending? How should the ascender be used when used in positioning systems? How should the ascender be used when used in operations?

5.4.5. Standards

Standard	Year	Title	Notes
ANSI Z459.1	2021	Safety Requirements for Rope Access Systems	
EN 567	2013	Mountaineering equipment. Rope clamps. Safety requirements and test methods	See also UIAA-126
EN 12841	2006	Personal fall protection Equipment—Rope access systems – Rope adjustment devices	Type B: working line ascender <input checked="" type="radio"/> EN 1891 Type A {rope} <input checked="" type="radio"/> Other {rope} types or other constructions
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	T: 5kN pull; G: 11kN pull

6. Anchorage System Equipment

6.1. Bolts and bolt hangers

6.1.1. Applications

<input type="checkbox"/>	System construction	Anchorage connector in rope access systems and other fall protection systems, operations, and rescue.
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6.1.2. Features

<input type="checkbox"/>	Strength	What is the manufacturer reported strength of the bolt or bolt hanger? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Construction	What materials are used in the construction of the bolt or bolt hanger? What is the diameter of the bolt?
<input type="checkbox"/>	Adjustment	How is the bolt fitted to a surface? Is the bolt removable or reusable?
<input type="checkbox"/>	Attachment	What attachment locations are available on the bolt?

6.1.3. Selection

<input type="checkbox"/>	Capacity	Is the bolt suitable for the user or load? Is the bolt suitable for use within rescue?
<input type="checkbox"/>	Structure	What materials are the bolt designed to interface with? What tools and materials are required to install the bolt? What spacing is required between bolts?
<input type="checkbox"/>	Direction of loading	What directions of loading does the bolt permit in relation to the attached structure?
<input type="checkbox"/>	Environment	Is the bolt suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the bolt satisfy presiding regulatory authority requirements?

6.1.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	Is the bolt installed according to manufacturer instructions? Is the bolt oriented and fitted appropriately to the surface? Is the surface free from potential interference from other clamps, equipment, or features of the work environment? Is direction of loading of system suitable for the bolt and surface?

6.1.5. Standards

Standard	Year	Title	Notes
ANSI Z359.18	2017	Safety Requirements for Anchorage Connectors for Active Fall Protection Systems	Type A: for active fall protection system other than T or D Type T: Suspended component/tie-back line or active fall protection system Type D: Deforming
BS 8610	2017	Personal fall protection equipment. Anchor systems. Specification	
EN 795	2012	Personal fall protection equipment. Anchor devices	A1: structural anchor for vertical, horizontal or inclined surfaces A2: structural anchor for inclined roofs B: transportable temporary anchors
GB 30862	2014	Personal fall protection equipment – Anchor devices	

6.2. Clamps

6.2.1. Applications

<input type="checkbox"/>	System construction	Anchorage connector in rope access systems and other fall protection systems, operations, and rescue.
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6.2.2. Features

<input type="checkbox"/>	Strength	What is the manufacturer reported strength of the clamp? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Adjustment	How is the clamp fitted to a structure? Are multiple adjustments required to fit the clamp to the structure?
<input type="checkbox"/>	Attachment	Where are systems attached to the clamp? Can the system attachment location be rotated or moved on the clamp?

6.2.3. Selection

<input type="checkbox"/>	Capacity	Is the clamp suitable for the user or load? Is the clamp suitable for use within rescue?
<input type="checkbox"/>	Structure	What structure is the clamp designed to interface with (e.g., steel joist, parapet wall)? What orientations can the clamp be used to interface with a structure? Do adjustment features of the clamp allow fitting to the structure in the work environment?
<input type="checkbox"/>	Direction of loading	What directions of loading does the clamp permit in relation to the attached structure?
<input type="checkbox"/>	Mobility	Does the clamp need to be repositioned frequently as part of the work plan?
<input type="checkbox"/>	Environment	Is the clamp suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the clamp satisfy presiding regulatory authority requirements?

6.2.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	Is the clamp oriented and fitted appropriately to the structure? Is the clamp free from potential interference from other clamps, equipment, or features of the work environment? Is direction of loading of system suitable for the clamp?
<input type="checkbox"/>	Adjustment	How is drop potential of the clamp reduced during adjustment? Does the clamp remain suitable for use following repositioning?

6.2.5. Standards

Standard	Year	Title	Notes
ANSI Z359.18	2017	Safety Requirements for Anchorage Connectors for Active Fall Protection Systems	Type A: for active fall protection system other than T or D Type T: Suspended component/tie-back line or active fall protection system Type D: Deforming
BS 8610	2017	Personal fall protection equipment. Anchor systems. Specification	
CSA Z259.15	2022	Anchorage Connectors	
EN 795	2012	Personal fall protection equipment. Anchor devices	A1: structural anchor for vertical, horizontal or inclined surfaces A2: structural anchor for inclined roofs B: transportable temporary anchors
GB 30862	2014	Personal fall protection equipment – Anchor devices	

6.3. Monopods and multipods

6.3.1. Applications

<input type="checkbox"/>	System construction	Anchorage connector in fixed and directional anchorage systems for rope access systems and other fall protection systems, operations, and rescue.
<input type="checkbox"/>	Rope and protection	Protect rope or other textiles from hazards of the work environment.
<input type="checkbox"/>	Edge protection	Protect surfaces from equipment used in rope access systems, operations, and rescue.

6.3.2. Features

<input type="checkbox"/>	Strength	What is the manufacturer reported strength of the device? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Adjustment	What configurations are available for the device? How are components of the device attached? What range of extension is available? What options are available for the device to contact the surfaces of the work environment
<input type="checkbox"/>	Attachment	What attachments are available on the device?

6.3.3. Selection

<input type="checkbox"/>	Capacity	Is the device suitable for the forces potentially applied in the selected configuration of the application?
<input type="checkbox"/>	Size	Can the device be configured to accommodate attaching the system in the desired location?
<input type="checkbox"/>	Stabilization	Are suitable anchorages available to prevent unintended movement of the device?
<input type="checkbox"/>	Direction of loading	What directions of loading does the device permit in relation to the attached structure?
<input type="checkbox"/>	Environment	Is the device suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the device satisfy <i>presiding regulatory authority</i> requirements?

6.3.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	Is the device installed according to manufacturer instructions? Is the device configured appropriately for the application? Is the device configured to prevent unintended movement? Does the configuration accommodate potential directions of loading during use?

6.3.5. Standards

Standard	Year	Title	Notes
ANSI Z359.18	2017	Safety Requirements for Anchorage Connectors for Active Fall Protection Systems	Type A: for active fall protection system other than T or D Type T: Suspended component/tie-back line or active fall protection system Type D: Deforming
BS 8610	2017	Personal fall protection equipment. Anchor systems. Specification	
EN 795	2012	Personal fall protection equipment. Anchor devices	B: transportable temporary anchors
GB 30862	2014	Personal fall protection equipment – Anchor devices	
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	T: ≥ 18kN G: ≥ 36kN

6.4. Plates and rings

6.4.1. Applications

- | | | |
|--------------------------|---------------------|---|
| <input type="checkbox"/> | System construction | Use within rope access systems and other fall protection systems, operations, and rescue. |
|--------------------------|---------------------|---|

6.4.2. Features

- | | | |
|--------------------------|------------|--|
| <input type="checkbox"/> | Strength | What is the manufacturer reported strength of the plate or ring?
Is the reported value a failure strength or a factor of the failure strength? |
| <input type="checkbox"/> | Attachment | What attachments are available on the plate or ring?
Is there a maximum number of attachments that can be made to the plate or ring?
Are there parts on the plate or ring that can be opened by hand or with a tool? |

6.4.3. Selection

- | | | |
|--------------------------|-----------------------|---|
| <input type="checkbox"/> | Capacity | Is the plate or ring construction and configuration suitable for the application? |
| <input type="checkbox"/> | Compatibility | Is the plate or ring suitable for use with selected connecting equipment? |
| <input type="checkbox"/> | Environment | Is the plate or ring suitable for the work environment? |
| <input type="checkbox"/> | Regulatory compliance | Does the plate or ring satisfy presiding regulatory authority requirements? |

6.4.4. Inspection and Use

- | | | |
|--------------------------|---------------------|--|
| <input type="checkbox"/> | Inspection | Refer to Section 3 and manufacturer instructions. |
| <input type="checkbox"/> | System construction | Is the plate or ring configuration suitable for application?
Does the plate or ring configuration accommodate potential directions of loading during use?
Are systems attached to the plate or ring in a manner that prevents interference with other systems? |

6.4.5. Standards

Standard	Year	Title	Notes
CEN/TS 16415	2013	Personal fall protection equipment - Anchor devices - Recommendations for anchor devices for use by more than one person simultaneously	
EN 795	2012	Personal fall protection equipment - Anchor devices	B: transportable temporary anchors
UIAA 130	2021	Load Sharing Devices	

6.5. Slings

6.5.1. Applications

<input type="checkbox"/>	System construction	Use within rope access systems and other fall protection systems, operations, and rescue.
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6.5.2. Features

<input type="checkbox"/>	Strength	What is the manufacturer reported strength of the sling? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Construction	What is the construction type of the sling? What materials are used in the sling construction? What is the diameter or width of the sling? Does the sling construction include protection against sharp edges or abrasion?
<input type="checkbox"/>	Elongation	What values are provided by the manufacturer?
<input type="checkbox"/>	Termination	How is the sling terminated?

6.5.3. Selection

<input type="checkbox"/>	Capacity	Is the sling construction and configuration suitable for the application? Has strength reduction from aging and knots been considered?
<input type="checkbox"/>	Compatibility	Is the sling suitable for use with selected connecting equipment?
<input type="checkbox"/>	Length	Is the sling an appropriate length for the application?
<input type="checkbox"/>	Environment	Is the sling suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the sling satisfy presiding regulatory authority requirements?

6.5.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	Is the sling configuration suitable for the application, including potentially applied forces? Does the sling configuration accommodate potential directions of loading during use? Does the sling configuration and direction of loading prevent unintended movement? Is the sling sufficiently protected from hazards of the work environment? Is connecting equipment oriented correctly with the sling configuration?

6.5.5. Standards

Standard	Year	Title	Notes
ANSI Z359.18	2017	Safety Requirements for Anchorage Connectors for Active Fall Protection Systems	Type A: for active fall protection system other than T or D Type T: Suspended component/tie-back line or active fall protection system Type D: Deforming
CEN/TS 16415	2013	Personal fall protection equipment - Anchor devices - Recommendations for anchor devices for use by more than one person simultaneously	
CSA Z259.15	2022	Anchorage Connectors	
GB 30862	2014	Personal fall protection equipment – Anchor devices	
EN 354	2010	Lanyards for fall arrest	
EN 566	2017	Mountaineering equipment – Slings	
EN 795	2012	Personal fall protection equipment - Anchor devices	B: transportable temporary anchors
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	End-to-end strap: T: $\geq 11\text{kN}$, G: $\geq 22\text{kN}$ Multiple configuration strap: T: $\geq 22\text{kN}$, G: $\geq 45\text{kN}$

7. Additional Rope Access Equipment and Assemblies

7.1. Powered ascenders, winches, and hoists

7.1.1. Applications

<input type="checkbox"/>	Main system	Use within rope access systems for ascent, descent, and positioning.
<input type="checkbox"/>	Raising/Lowering system	Use within rope access operations and rescue systems to move a person or load.

7.1.2. Features

<input type="checkbox"/>	Rope engagement	How does the device interface with the rope (e.g., capstan, traction sheave)?
<input type="checkbox"/>	Powered Control	What power sources can be used to operate the device? <input type="checkbox"/> Battery <input type="checkbox"/> Fuel <input type="checkbox"/> Outlet <input type="checkbox"/> Manual How does the user control the device to take in and let out rope? Is remote control available? What type and range?
<input type="checkbox"/>	Manual Control	Can rope be taken in or let out of the device manually? Are manual controls intended for regular use?
<input type="checkbox"/>	Operating rate	At what rate does the device take in and let out rope? Is the rate variable?
<input type="checkbox"/>	Tension limiter	Does the device have a mechanism to automatically shut down operation if system tension is too high? If so, what is the tension at which operation will stop?
<input type="checkbox"/>	Emergency Stop	Does the device have a mechanism to manually shut down operation of the device?
<input type="checkbox"/>	Ingress protection	What rating does the device have for resistance to ingress of solids or liquids.

7.1.3. Selection

<input type="checkbox"/>	Capacity	Is the device suitable for user weight, including tools and other equipment?
<input type="checkbox"/>	Equipment compatibility	What rope construction, materials, and diameters can be used with the device? Where can the device be removed from the rope?
<input type="checkbox"/>	Range	What is the estimated range of operation for the expected load?
<input type="checkbox"/>	Environment	Is the power source suitable for the work environment? Is ingress protection rating (IP) suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does ascender satisfy presiding regulatory authority requirements?

7.1.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	How is the device and system attached to the harness? How is rope threaded through the device? What are considerations for use in rope access operations?
<input type="checkbox"/>	Adjustment	How should device be handled when taking in or letting out rope? How is device secured to prevent unintended movement? Is rope managed to ensure unhindered maneuvers or operations?
<input type="checkbox"/>	Remote control	How is interference between devices prevented?
<input type="checkbox"/>	Rescue use	Are alternatives provided for exiting maneuvers or operations if device operation is inhibited? Are there additional considerations when the device is used in rescue?

7.1.5. Standards

Standard	Year	Title	Notes
ANSI Z359.4	2013 R2022	Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components	

7.2. Protectors

7.2.1. Applications

<input type="checkbox"/>	Rope protection	<i>Protect rope or other textiles from hazards of the work environment.</i>
<input type="checkbox"/>	Edge protection	<i>Protect surfaces from equipment used in rope access systems, operations, and rescue.</i>

7.2.2. Features

<input type="checkbox"/>	Construction	<i>What materials are used in the protector construction? Does the protector have sections for separating rope or other textiles? Can ropes be secured within the protector?</i>
<input type="checkbox"/>	Attachment	<i>What attachments are available on the protector? How can the protector be secured in its location?</i>

7.2.3. Selection

<input type="checkbox"/>	Application	<i>Is the protector suitable for the maneuver or operation?</i>
<input type="checkbox"/>	Environment	<i>Is the protector suitable for the work environment?</i>

7.2.4. Inspection and Use

<input type="checkbox"/>	Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/>	System construction	<i>Is protector configuration suitable for application? Is protector secured to prevent unintended movement? Does protector accommodate potential directions of loading during use?</i>

7.2.5. Standards

Standard	Year	Title	Notes
N/A			

7.3. Pulleys

7.3.1. Applications

<input type="checkbox"/>	Directional anchorage systems	Use within rope systems to reduce friction at changes of direction.
<input type="checkbox"/>	Raising/Lowering system	Use within mechanical advantage systems.
<input type="checkbox"/>	Tensioned rope systems	Use to connect person or load within tensioned rope systems.

7.3.2. Features

<input type="checkbox"/>	Strength	What is the maximum allowable loading of the pulley? Is the reported value a failure strength or a factor of the failure strength?
<input type="checkbox"/>	Sheaves	How many sheaves does the pulley have?
<input type="checkbox"/>	Side plates	Does the pulley have fixed or moving side plates? Can a moving side plate be opened without removing the pulley from a connector?
<input type="checkbox"/>	Attachment	What attachments are available on the pulley?
<input type="checkbox"/>	Adjustment	Does the pulley have a feature to engage the rope or other material? Is this feature always enabled or can this feature be placed in a disengaged position?
<input type="checkbox"/>	Swivel	Does the pulley incorporate a swivel?

7.3.3. Selection

<input type="checkbox"/>	Capacity	Is the device and pulley suitable for the application? Have the angles and forces of the system been considered?
<input type="checkbox"/>	Equipment compatibility	Is the connector appropriate for the pulley?
<input type="checkbox"/>	Rope compatibility	Is the pulley suitable for the size and construction of the rope being used?
<input type="checkbox"/>	Sheaves	Do all sheaves need to be used to ensure appropriate loading?
<input type="checkbox"/>	Environment	Is the pulley suitable for work environment?
<input type="checkbox"/>	Regulatory compliance	Does the pulley satisfy presiding regulatory authority requirements?

7.3.4. Inspection and Use

<input type="checkbox"/>	Attachment	Is the pulley secured appropriately to the connector?
<input type="checkbox"/>	Rope path	Does the rope pass through the pulley in the correct orientation?

7.3.5. Standards

Standard	Year	Title	Notes
EN 12278	2007	Mountaineering equipment. Pulleys. Safety requirements and test methods	See also UIAA-127
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	T: ≥ 18kN (4046 lbf) G: ≥ 36kN (8093 lbf)

7.4. Raising system kits

7.4.1. Applications

<input type="checkbox"/>	System construction	Use in rope access systems and other fall protection systems, operations, and rescue.
<input type="checkbox"/>	Raising/Lowering system	Use within rope access operations and rescue systems to move a person or load.

7.4.2. Features

<input type="checkbox"/>	Construction	What Connectors , Pulleys , and Ropes and lanyards or other materials are used in the device? Does device have a sleeve covering the rope or other materials?
<input type="checkbox"/>	Adjustment	How does the device engage the rope or other materials? Is the adjustment feature always enabled or can this feature be placed in a disengaged position? Can the rope or other material be let out in a controlled manner?

7.4.3. Selection

<input type="checkbox"/>	Capacity	Is the device and configuration suitable for the application?
<input type="checkbox"/>	Efficiency	Does the configuration of the device allow for ease of raising the desired load?
<input type="checkbox"/>	Environment	Is the device suitable for work environment?
<input type="checkbox"/>	Regulatory compliance	Does the device satisfy presiding regulatory authority requirements?

7.4.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	System construction	How is the device attached within the system? Where is the desired location for the engagement mechanism? What is the desired direction of pull? How is rope threaded through the device? What are considerations for use in rope access operations?
<input type="checkbox"/>	Adjustment	How should device be handled when taking in or letting out rope? How is device secured to prevent unintended movement? Is rope managed to ensure unhindered maneuvers or operations?

7.4.5. Standards

Standard	Year	Title	Notes
ANSI Z359.4	2013 R2022	Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components	
EN 358	2018	Personal protective equipment for work positioning and prevention of falls from a height. Belts for work positioning and restraint and work positioning lanyards	

8. Additional Fall Protection Equipment and Assemblies

8.1. Positioning lanyards

8.1.1. Applications

<input type="checkbox"/>	Positioning	Use within positioning systems.
<input type="checkbox"/>	Travel restraint	Use within travel restraint systems.

8.1.2. Features

<input type="checkbox"/>	Construction	What materials are used in the energy absorbing lanyard construction?
<input type="checkbox"/>	Length	What is the length of the positioning lanyard assembly?
<input type="checkbox"/>	Adjuster	Can the length of the positioning lanyard be adjusted? Can the adjustment device be operated under partial or full weight of user?

8.1.3. Selection

<input type="checkbox"/>	Capacity	Is the positioning lanyard suitable for the weight and free fall potential of the user?
<input type="checkbox"/>	Anchorage system	Are anchorages and anchorage connectors suitable for use with the positioning lanyard?
<input type="checkbox"/>	Environment	Is the positioning lanyard suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the positioning lanyard satisfy <i>presiding regulatory authority</i> requirements?

8.1.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	Harness attachment	Where is the positioning lanyard attached to harness? What configurations are suitable for establishing positioning systems? <input type="checkbox"/> Lateral to lateral <input type="checkbox"/> Ventral basket <input type="checkbox"/> Ventral linear
<input type="checkbox"/>	Installation	Does the positioning system configuration prevent uncontrolled lateral or vertical movement?
<input type="checkbox"/>	Adjustment	How is length of the positioning system adjusted in a controlled manner?

8.1.5. Standards

Standard	Year	Title	Notes
ANSI Z359.3	2019	Safety Requirements for Lanyards and Positioning Lanyards	
CSA Z259.11	2017	Personal energy absorbers and lanyards	D: Lineman's pole strap E: Chain work positioning lanyard F: Adjustable work positioning lanyard
EN 354	2010	Personal fall protection equipment. Lanyards	
EN 358	2018	Personal protective equipment for work positioning and prevention of falls from a height. Belts for work positioning and restraint and work positioning lanyards	
GB/T 23543	2009	Personal fall protection equipment - Lanyards	

8.2. Travel restraint systems

8.2.1. Applications

<input type="checkbox"/>	Travel restraint	Protection from exposure to potential fall to a lower level.
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8.2.2. Features

<input type="checkbox"/>	Anchorage	<i>Does the travel restraint system incorporate a single anchorage? Does the travel restraint system incorporate a horizontal lifeline?</i>
<input type="checkbox"/>	Adjustability	<i>Is the length of the travel restraint system adjustable?</i>

8.2.3. Selection

<input type="checkbox"/>	Capacity	<i>Is the travel restraint system suitable for user weight, including tools and other equipment?</i>
<input type="checkbox"/>	Equipment	<i>What equipment is used to establish the travel restraint system?</i>
<input type="checkbox"/>	Regulatory compliance	<i>Does descender satisfy presiding regulatory authority requirements?</i>

8.2.4. Inspection and Use

<input type="checkbox"/>	Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/>	Harness attachment	<i>Where is the travel restraint system attached to harness?</i>
<input type="checkbox"/>	Anchorage system	<i>Are selected anchorages suitable for the work location? Have potential fall directions been addressed?</i>
<input type="checkbox"/>	Adjustment	<i>How is the length of the travel restraint system adjusted? Does the adjustment device require action to prevent unintended extension of the system?</i>
<input type="checkbox"/>	System effectiveness	<i>Has angle in relation to fall hazards been considered and addressed? Has sag of any incorporated horizontal lifeline been considered and addressed?</i>

8.2.5. Standards

Standard	Year	Title	Notes
See Sections 5 Rope Access Fundamental Equipment , 8.1 Positioning lanyards			

8.3. Self-retracting devices

8.3.1. Applications

<input type="checkbox"/>	Fall arrest	Use within fall arrest systems.
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8.3.2. Features

<input type="checkbox"/>	Construction	What materials and equipment are used in the self-retracting device construction?
<input type="checkbox"/>	Length	What is the length of the self-retracting device?
<input type="checkbox"/>	Reeling location	Where is the self-retracting device mounted (e.g., anchorage, harness)?
<input type="checkbox"/>	Energy management	How does the self-retracting device engage stop a fall (e.g., rotation, acceleration, other)? How does the self-retracting device manage energy of a fall event? Does the self-retracting device have an external energy absorber?
<input type="checkbox"/>	Raising or lowering system	Can the self-retracting device be released to raise or lower a suspended individual?

8.3.3. Selection

<input type="checkbox"/>	Capacity	Is the self-retracting device suitable for the weight and free fall potential of the user?
<input type="checkbox"/>	Obstructions	Is the self-retracting device suitable for contact with potential obstructions in the event of a fall?
<input type="checkbox"/>	Clearance requirements	What are clearance requirements of the self-retracting device?
<input type="checkbox"/>	Environment	Is the self-retracting device suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the self-retracting device satisfy presiding regulatory authority requirements?

8.3.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions.
<input type="checkbox"/>	Harness attachment	Where is the self-retracting device attached to harness?
<input type="checkbox"/>	Stowing of device	Is the self-retracting device stowed in reeled configuration? Is a tow cord available to assist controlled stowing of the self-retracting device?
<input type="checkbox"/>	Obstructions	Are obstructions, including body position, prevented from interfering with the self-retracting device?
<input type="checkbox"/>	Movement	Is movement at height controlled to prevent unintended engagement of the self-retracting device?

8.3.5. Standards

Standard	Year	Title	Notes
ANSI Z359.14	2021	Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems	Class 1: Overhead anchorage, free fall ≤ 2 ft (610mm) Class 2: Free fall ≤6 feet (1.8m) over an edge SRL-P: Personal (i.e., attached to harness) SRL-R: Rescue (i.e., controlled release while under tension) Pre-2021: Class A: Arrest distance ≤ 24" (610mm) Class B: Arrest distance ≤ 54" (1372 mm) SRL-LE (Leading Edge): Free fall ≤ 5 ft (1.5 m) over an edge
CSA Z259.2.2	2017	Self-Retracting Devices	SRL: Self-retracting lifeline SRL-R: Integral rescue capability.. SRL-LE: Leading edge capability. SRL-LE-R: Leading Edge and integral rescue capability.
GB 24544	2009	Personal fall protection equipment – Retractable type fall arrester	
ISO 10333-3	2000	Personal fall-arrest systems -- Part 3: Self-retracting lifelines	

8.4. Ladder fall arrest devices and systems

8.4.1. Applications

<input type="checkbox"/> Fall arrest	<i>Use within fall arrest systems.</i>
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8.4.2. Features

8.4.2.1. Carrier	
<input type="checkbox"/> Construction	<i>What materials and equipment are used in the carrier construction? What is the carrier type? What is the carrier diameter?</i>
<input type="checkbox"/> Height	<i>What is the height of the carrier? Are there intermediate anchorage systems used along the carrier?</i>
<input type="checkbox"/> Energy management	<i>Does the carrier incorporate an energy absorber?</i>
<input type="checkbox"/> Tension	<i>What is the tension of the carrier? How is the carrier tensioned?</i>
8.4.2.2. Ladder fall arrest device	
<input type="checkbox"/> Engagement mechanism	<i>How does the ladder fall arrest device stop a fall?</i>
<input type="checkbox"/> Carrier path protection	<i>Is there a feature to hinder threading the ladder fall arrest device incorrectly?</i>
<input type="checkbox"/> Energy management	<i>Does the ladder fall arrest device incorporate an energy absorber?</i>

8.4.3. Selection

<input type="checkbox"/> Capacity	<i>Is the ladder fall arrest system suitable for the weight of the users? How many simultaneous users does the carrier accommodate? Are there spacing requirements between simultaneous users?</i>
<input type="checkbox"/> Equipment compatibility	<i>Are the carrier and the ladder fall arrest device compatible? Can the ladder fall arrest device pass any intermediate anchorage systems? Where can the ladder fall arrest device be removed from the carrier?</i>
<input type="checkbox"/> Clearance requirements	<i>What are clearance requirements of the ladder fall arrest system?</i>
<input type="checkbox"/> Environment	<i>Is the ladder fall arrest system suitable for the work environment?</i>
<input type="checkbox"/> Regulatory compliance	<i>Does the ladder fall arrest system satisfy presiding regulatory authority requirements?</i>

8.4.4. Inspection and Use

<input type="checkbox"/> Inspection	<i>Refer to Section 3 and manufacturer instructions. Is the carrier installed correctly, including initial tension?</i>
<input type="checkbox"/> Harness attachment	<i>Where is the ladder fall arrest device attached to harness?</i>
<input type="checkbox"/> System access	<i>How is access to and use of the ladder fall arrest system maintained? Is unintended movement of ladder fall arrest device prevented if it remains attached to the carrier when not in use?</i>
<input type="checkbox"/> Obstructions	<i>Are obstructions, including body position, prevented from interfering with the self-retracting device?</i>
<input type="checkbox"/> Movement	<i>Is movement at height controlled to prevent unintended engagement of the ladder fall arrest device?</i>

8.4.5. Standards

Standard	Year	Title	Notes
ANSI Z359.16	2016	Safety Requirements for Climbing Ladder Fall Arrest Systems	
CSA Z259.2.1	2011	Fall Arresters, Vertical Lifelines and Rails	
CSA Z259.2.4	2012	Fall arresters and vertical rigid rails	
EN 353-1	2002	Personal protective equipment against falls from a height. Guided type fall arresters including a rigid anchor line	
GB 24542	2009	Personal fall protection equipment – Guided type fall arrester including a rigid anchor line	
ISO 10333-4	2002	Personal fall-arrest systems -- Part 4: Vertical rails and vertical lifelines incorporating a sliding-type fall arrester	

8.5. Energy absorbers and energy absorbing lanyards

8.5.1. Applications

<input type="checkbox"/> Fall arrest	<i>Use within fall arrest systems.</i>
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8.5.2. Features

<input type="checkbox"/> Lanyard style	<input type="checkbox"/> Single energy absorber for multiple lanyards <input type="checkbox"/> Energy absorber in each lanyard
<input type="checkbox"/> Length	<i>What is the length of the energy absorbing lanyard assembly?</i>
<input type="checkbox"/> Construction	<i>What materials are used in the energy absorbing lanyard construction?</i>
Connection type	<i>What connector is used to interface with anchorages or anchorage connectors? Are there back-clip configurations for the lanyard?</i>

8.5.3. Selection

<input type="checkbox"/> Capacity	<i>Is the energy absorbing lanyard suitable for the weight and free fall potential of the user?</i>
<input type="checkbox"/> Anchorage system	<i>Are anchorages and anchorage connectors suitable for use with energy absorbing lanyard?</i>
<input type="checkbox"/> Clearance requirements	<i>What are clearance requirements of the energy absorbing lanyard?</i>
<input type="checkbox"/> Obstructions	<i>Is the energy absorbing lanyard suitable for contact with potential obstructions in the event of a fall?</i>
<input type="checkbox"/> Environment	<i>Is the energy absorbing lanyard suitable for the work environment (e.g., hot or electrical work)?</i>
<input type="checkbox"/> Regulatory compliance	<i>Does the energy absorbing lanyard satisfy presiding regulatory authority requirements?</i>

8.5.4. Inspection and Use

<input type="checkbox"/> Inspection	<i>Refer to Section 3 and manufacturer instructions.</i>
<input type="checkbox"/> Harness attachment	<i>Where is the energy absorbing lanyard attached to harness?</i>
<input type="checkbox"/> Anchorage system	<i>Are anchorages and anchorage connectors selected and used in a manner to minimize free fall potential and potential swing fall?</i>
<input type="checkbox"/> Allowable connections	<i>Can multiple lanyards be connected at the same height?</i>
<input type="checkbox"/> Stowing of lanyards	<i>Are unused lanyards stowed correctly on harness?</i>
<input type="checkbox"/> Obstructions	<i>Are obstructions, including body position, prevented from interfering with the self-retracting device?</i>

8.5.5. Standards

Standard	Year	Title	Notes
ANSI Z359.13	2013 R2022	Personal Energy Absorbers and Energy Absorbing Lanyards	6 ft FF: free fall ≤ 6 ft (1.83 m), 48 in (1.2 m) maximum deployment, AAF ≤ 900 lbf (4 kN), MAF ≤ 1800 lbf (8kN) 12 ft FF: free fall ≤ 12 ft (3.66 m), 60 in (1.5 m) maximum deployment, AAF ≤ 1350 lbf (6 kN), MAF ≤ 1800 lbf (8kN)
CSA Z259.11	2017	Personal energy absorbers and lanyards	Class A: Rope, B: Web, C: Wire rope, Y: Y-lanyard Black label, white font: max free fall > 1.8 m White label, black font: max free fall ≤ 1.8m Pre 2017: E4: MAF 4kN (900lb), Max dep: 1.2m (3.94 ft), 100 lbs – 254 lbs (45 kg – 115 kg) E6: MAF 6kN (1350 lb), Max dep: 1.75m (5.74 ft), 200 lbs – 386 lbs (91 kg – 175 kg)
EN 355	2002	Personal protective equipment against falls from a height - Energy absorbers	Max deployment < 1.75m, MAF 6kN
GB/T 24538	2009	Personal fall protection equipment – Energy absorbers	

8.6. Horizontal lifelines

8.6.1. Applications

<input type="checkbox"/>	Fall arrest	Use within fall arrest systems.
<input type="checkbox"/>	Travel restraint	Use within travel restraint systems.

8.6.2. Features

<input type="checkbox"/>	Construction	What materials and equipment are used in the horizontal lifeline construction?
<input type="checkbox"/>	Length	What is the maximum length between anchorages in the horizontal lifeline? Are there intermediate anchorages used in the horizontal lifeline?
<input type="checkbox"/>	Energy absorption	Does the horizontal lifeline incorporate an energy absorber?
<input type="checkbox"/>	Tension	What is the tension of the horizontal lifeline? How is the horizontal lifeline tensioned?

8.6.3. Selection

<input type="checkbox"/>	Capacity	Is the horizontal lifeline suitable for the application, considering weights and free fall potential of the users? How many simultaneous users does the horizontal lifeline accommodate? Are there spacing requirements between simultaneous users?
<input type="checkbox"/>	Anchorage	What are the anchorage requirements for the horizontal lifeline?
<input type="checkbox"/>	Connecting equipment	What equipment is suitable for connecting the user to the horizontal lifeline? Does connecting equipment allow for passing intermediate anchorage systems?
<input type="checkbox"/>	Clearance requirements	What are clearance requirements of the horizontal lifeline and connecting equipment? Have clearance requirements included deflection of the horizontal lifeline?
<input type="checkbox"/>	Environment	Is the horizontal lifeline suitable for the work environment?
<input type="checkbox"/>	Regulatory compliance	Does the horizontal lifeline satisfy presiding regulatory authority requirements?

8.6.4. Inspection and Use

<input type="checkbox"/>	Inspection	Refer to Section 3 and manufacturer instructions or design specifications. Is the horizontal lifeline installed in accordance with design specifications, including initial tension?
<input type="checkbox"/>	Connecting equipment	Is selected equipment suitable for the horizontal lifeline application?
<input type="checkbox"/>	Harness attachment	Where is connecting equipment attached to harness?

8.6.5. Standards

Standard	Year	Title	Notes
AS/NZ 1891.2	2001	Industrial fall-arrest systems and devices Part 2: Horizontal lifeline and rail systems	
CSA Z259.13	2016	Manufactured horizontal lifeline systems	
EN 795	2012	Personal fall protection equipment. Anchor devices	C: anchor device incorporating horizontal flexible line D: anchor device incorporating horizontal rigid rail
GB 38454	2019	Personal fall protection equipment – Horizontal lifeline device	
ISO 16024	2005	Personal protective equipment for protection against falls from a height - Flexible horizontal lifeline systems	

Appendix 1. Additional Program, System, and Related Standards

Standard	Year	Title	Notes
ANSI A10.32	2023	Fall Protection Systems for Construction and Demolition Operations	
ANSI Z359.2	2023	Minimum Requirements for a Comprehensive Managed Fall Protection Program	
ANSI Z359.4	2013 R2022	Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components	
ANSI Z359.6	2016	Specifications and Design Requirements for Active Fall Protection Systems	
ANSI Z459.1	2021	Safety Requirements for Rope Access Systems	
ASTM E2505	2014	Standard Practice for Industrial Rope Access	
ASTM F887	2004	Standard Specifications for Personal Climbing Equipment	
BS 7883	2019	Personal fall protection equipment. Anchor systems. System design, installation and inspection. Code of practice	
BS 7985	2013	Code of practice for the use of rope access methods for industrial purposes – Recommendations and guidance supplementary to BS ISO 22846	
CSA Z259.16	2015 R2020	Design of active fall–protection systems	
CSA Z259.17	2016 R2020	Selection and use of active fall–protection equipment and systems	
EN 363	2019	Personal fall protection equipment. Personal fall protection systems	
GB/T 6095	2021	Fall protection – Personal fall protection systems	
GB/T 6096	2020	Fall protection – Performance test methods for fall protection systems	
ISO 22846–1	2003	Personal equipment for protection against falls – Rope access systems — Part 1: Fundamental principles for a system of work	
ISO 22846–2	2012	Personal equipment for protection against falls – Rope access systems — Part 2: Code of Practice	
NFPA 2500	2022	Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services	
XF 494	2004	Fire service fall protection equipment	

Appendix 2. Superseded or Withdrawn Standards

Standard	Year	Title	Notes
AS/NZS 4142.3	1993	Man–made fibre rope for static life rescue lines	<i>Withdrawn 2021</i>
NFPA 1983	2017	Standard on Life Safety Rope and Equipment for Emergency Services	<i>Superseded by NFPA 2500</i>
AS/NZS 4488.1	1997	Industrial Rope Access Systems: Specifications	<i>Superseded by ISO 22846 - 2020</i>
AS/NZS 4488.2	1997	Industrial Rope Access Systems, Selection use, and maintenance	<i>Superseded by ISO 22846 - 2020</i>