

CLIMBING WALL ASSOCIATION, INC.

WORK-AT-HEIGHT STANDARD
FOR CLIMBING WALL FACILITIES

FIRST EDITION
April 27,2017



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**Climbing Wall Association
Work-at-Height Standard
For Climbing Wall Facilities**

First Edition
April 27, 2017

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INTRODUCTION

Mission of the Climbing Wall Association

The mission of the Climbing Wall Association is to support the growth, health, independence and professionalism of the climbing wall industry.

Work-at-Height Standard Overview

The purpose of the Work-at-Height Standard is to raise awareness of acceptable criteria for work-at-height programs in recreational climbing wall facilities such as a commercial climbing gym. The Work-at-Height Standard is intended to assist the employer in identifying, evaluating, eliminating or controlling the risks and hazards related to work-at-height in a climbing facility, to the extent possible, in a manner consistent with accepted industry practices and existing legal requirements.

While the Work-at-Height Standard provides a framework to assist climbing wall operators in developing a sound Work-at-Height Program, specific ways of implementing this Standard will vary with the mission and purpose of the organization, the facility design, equipment in use, employee experience, training programs and other factors. The Work-at-Height Standard does not purport to provide specific solutions to workplace risks and hazards - identifying those risks and hazards and developing appropriate and adequate plans are the responsibility of the employer.

The Work-at-Height Standard is intended to be flexible in its implementation. In this regard, it is valuable to note that professional judgment is an important element in any workplace. Although the Work-at-Height Standard represents an industry effort to outline responsible workplace practices, professional judgment may, in a given circumstance, justify a deviation from any standard when a deviation is in the best interest of the worker's health, safety or well-being.

The Work-at-Height Standard has been developed through a consensus effort by members of the climbing wall industry and reviewed by industry experts. As such, it is a dynamic document that will be periodically reviewed and revised from time to time.

The document is divided into eight sections followed by a number of informative annexes that provide additional information. Informative annexes may provide discussion, explanation, examples or other resources and are not considered part of the Work-at-Height Standard

Limitations of the Work-at-Height & Disclaimer

The Work-at-Height Standard is intended for use by experienced professionals in the climbing industry. Misuse or improper interpretation of the Work-at-Height Standard may result in serious injury or death. The CWA reserves the exclusive right to issue or not to issue official interpretations of the Work-at-Height Standard. Requests for interpretations must be made in writing to the CWA.

The Work-at-Height Standard does not attempt to encompass every possible policy, procedure or practice that may be implemented in a given circumstance. Furthermore, compliance with the Work-at-Height Standard does not guarantee that a climbing facility will be a safe workplace or that workers will be free from harm.

All wall owners, operators, employees or others working in a climbing wall facility must understand that work-at-height whether indoors in a climbing facility, or outside, is a technical activity involving inherent and other risks, hazards and danger that can lead to equipment or property damage and injury or death.

CWA disclaims all duty, responsibility, or liability to climbing wall owners, operators, employees, clients, participants, and other parties for any equipment damage, property damage, injury, death or other loss resulting from any cause, including any cause claimed to be a result of a person's or organization's adherence to, or failure to adhere to, the Work-at-Height Standard.

1 Scope, Purpose, Applications, Exceptions, and Interpretations

1.1 Scope

- 1.1.1 This standard establishes acceptable criteria and requirements for an employer's managed work-at-height program for general climbing wall operations, including administration, policies and procedures, employer responsibilities, role of personnel, training, hazard assessment, fall protection planning, appropriate equipment selection and use, and rescue requirements. Additional criteria and requirements may be necessary under specific working conditions.

1.2 Purpose

- 1.2.1 This is a voluntary standard.
- 1.2.2 The purpose of this standard is to assist the employer in identifying, evaluating, eliminating or controlling the risks and hazards related to work-at-height in a climbing facility, to the extent possible, in a manner consistent with accepted industry practices and existing legal requirements. This standard is to serve as certification criteria for Qualified and Competent Climbing Wall Workers. This standard is intended as a guide to national, state, provincial, and local authorities in drafting regulations and may be adopted in whole or in part by reference to avoid drafting unnecessary or redundant regulations for climbing facilities.

1.3 Application

- 1.3.1 This standard is intended for use by recreational climbing wall facilities, both sport climbing and bouldering facilities, where employees, or other persons, are exposed to fall hazards while working at height (for example: routesetting, performing inspections, etc.)
- 1.3.2 This standard does not apply to participation in the sport of climbing.

1.4 Exceptions or Variance

- 1.4.1 Variance from this standard is permissible when its requirements are not possible or reasonably practicable.
- 1.4.2 Variance from this standard is permissible when, in a given circumstance, a trained professional can justify deviation from this standard when the deviation is in the best interest of the worker's health, safety or well-being.
- 1.4.3 Variance from this standard is permissible when an employer is following the manufacturer's instructions for use for personal protective equipment or machinery.
- 1.4.4 National, state, provincial or regulatory agencies may impose requirements that represent exceptions to this standard.
- 1.4.5 In cases of variances or exceptions, the employer shall implement alternative measures that provide equivalent, or better, controls for risks and hazards.

1.5 Interpretations

- 1.5.1 Requests for interpretations of this standard shall be in writing and be addressed to the Climbing Wall Association, Inc., the Secretariat of this standard.

2 References

2.1 Normative References

2.1.1 This standard may contain references to law, regulations, rules or other standards which, if cited outside of Annex A, constitute normative references and therefore provisions of this standard.

2.2 Referenced Documents

2.2.1 Referenced Documents were current at the time of publication of this standard and were consulted as references in relation to this standard and are not considered normative references. See Annex A.

3 Definitions

3.1 Climbing Wall Workers

- 3.1.1 **Authorized Climbing Wall Worker:** A person granted the authority, or assigned by the employer, to perform work-at-height operations under the direct supervision of a competent or qualified person. An Authorized Climbing Wall Worker must be trained in identifying potential fall hazards, the use of PPE and fall protection systems, and the activation of the Rescue Plan. Examples might include an assistant routesetter or routesetter.
- 3.1.2 **Competent Climbing Wall Worker:** A person granted the authority, or as assigned by the employer, to be responsible for: the training and immediate supervision of Authorized Climbing Wall Workers; implementation and monitoring of the employer's managed fall protection program; implementation, supervision and monitoring of the employer's Rescue Plan; and identifying, evaluating and controlling potential fall hazards. The Competent Climbing Wall Worker must be trained and/or certified to perform these duties and responsibilities and must have the authority to stop work-at-height operations immediately to mitigate potential fall hazards. Examples might include a routesetter or head routesetter.
- 3.1.3 **Qualified Climbing Wall Worker:** A person with a degree, training or equivalent experience in work-at-height operations who is responsible for the administration of: hazard assessment for work-at-height; development and monitoring of the employer's managed fall protection program; development and monitoring of the employer's Rescue Plan; and the training and supervision of competent climbing wall workers. The Qualified Climbing Wall Worker must be trained and/or certified to assume overall responsibility for designing, analyzing, specifying and evaluating fall protection and rescue systems according to the code of local adoption. Examples might include an owner, regional manager, general manager, facility manager or head routesetter.

3.2 Fall Protection Systems

- 3.2.1 **Travel Restraint System:** A system comprised of compatible components designed to secure the climbing wall worker to an anchorage using equipment that prevents the worker from reaching the fall hazard. A travel restraint system typically includes an anchor, connectors, restraint lanyard and harness.
- 3.2.2 **Positioning System:** A system comprised of compatible components designed to support a climbing wall worker under tension in an at-height work position allowing hands free work or orientation in space. A positioning system used alone does not constitute fall protection. A positioning system typically includes an anchor, connectors, a positioning lanyard, and a harness.

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- 3.2.3 **Suspension System:** A system comprised of compatible components designed to secure, raise and lower a climbing wall worker suspended from an anchor or anchors. A suspension system is under tension and is capable of supporting at least twice the anticipated load for the purpose of accessing a work location and performing the work and may incorporate a fall arrest system. A suspension system typically consists of an anchor, suspension rope, ascending and/or descending system, connectors, and a harness.
- 3.2.4 **Fall Arrest System:** A system comprised of compatible components designed to arrest a free fall, preventing contact with a horizontal walking working surface or the ground, while limiting the impact forces to the climbing wall worker according to the code of local adoption. A fall arrest system typically consists of an anchor, lifeline and fall arrester or energy absorbing lanyard, connectors, and full body harness.
- 3.2.5 **Attended Belay System:** a system of equipment, and corresponding techniques, operated by a second person that controls a climbing rope, conforming to UIAA 101, to provide fall protection to a moving or stationary climber. An attended belay system typically consists of an anchor, climbing rope, braking device, connectors, and a harness.
- 3.2.6 **Auto Belay Device (Auto Belay):** A controlled descent device designed for use in the recreational climbing industry that permits repeated descents and incorporates a self-regulating braking mechanism, controlled descent rate and automatic line retraction.

3.3 Personal Protective Equipment

- 3.3.1 **Ascender:** A device designed to be used for personal ascent or work positioning on a rope. It functions by gripping the rope in one direction while sliding freely in the opposite direction. Ascenders are not used for fall arrest.
- 3.3.2 **Braking Device:** A mechanical device attached to a lifeline, through which the rope passes, which generates forces on the rope in a controlled manner, which opposes movement of the rope through the device.
- 3.3.3 **Connectors:** a component or element that is used to couple parts of the system together (e.g. carabiner)
- 3.3.4 **Descender:** A device designed to be used on a rope for personal descent or to lower another worker from an elevation in a controlled manner.
- 3.3.5 **Fall Arrester:** A device that travels on a lifeline and will automatically engage or lock onto the lifeline in the event of a fall.
- 3.3.6 **Harness (Sit):** a body support that encircles and closes around the waist and legs with attachment points appropriate for positioning or climbing.
- 3.3.7 **Harness (Full Body):** A body support designed to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest and shoulders.

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- 3.3.8 **Helmet:** Headwear designed and intended to provide limited protection against hazards such as impact, flying or falling objects and/or electric shock.
- 3.3.9 **Lanyard (Positioning):** A lanyard used to connect a harness to an anchor in a positioning system. Positioning lanyards may be fixed length or adjustable and are not for use in fall arrest. Must be used in conjunction with a suspension or fall arrest system.
- 3.3.10 **Lanyard (Fall Arrest):** A lanyard used to connect a harness to a fall arrester or anchor in a fall arrest system. A fall arrest lanyard has the ability to absorb energy and limit the impact forces to the climbing wall worker (often achieved through an integrated energy absorber).
- 3.3.11 **Lifeline:** A component of a fall protection system consisting of a flexible line (often a kernmantle rope) designed to hang either vertically or to span horizontally.

3.4 Other Definitions

- 3.4.1 **Anchor:** A secure connecting point or a terminating component of a fall protection system or rescue system capable of supporting the impact forces applied by a fall protection or rescue system.
- 3.4.2 **Climbing Route:** An area of the surface of a manufactured climbing structure intended for recreational climbing. Modular climbing holds are affixed to the climbing route to allow a climber to ascend or descend the climbing route. Climbing routes are graded by difficulty using various rating scales.
- 3.4.3 **Confined Space:** A space large enough for a worker to enter fully and perform assigned work that is not designed for continuous occupancy and has a limited or restricted means of entry or exit.
- 3.4.4 **Fall Protection Plan:** A written document that describes the specific practices, equipment and methods to be used to protect climbing wall workers from fall hazards.
- 3.4.5 **Free Fall Distance:** The vertical distance traveled during a fall, measured from the onset of a fall from a work position to the point at which the fall protection system begins to arrest the fall.
- 3.4.6 **Total Fall Distance:** The total vertical distance required to arrest a fall.
- 3.4.7 **Hazard Assessment:** A written document that identifies existing or potential hazards and describes a method or methods for eliminating or controlling those hazards.
- 3.4.8 **Rescue Plan:** A written document that describes the manner in which rescue is to be approached under certain circumstances, including timeliness, location, equipment and access method.
- 3.4.9 **Work-at-Height:** work performed above ground or any other working surface where a fall hazard exists. Requirements for control of fall hazards or fall protection will vary by industry, type of work performed, hazards present and jurisdiction. See Annex B.

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- 3.4.10 **Routesetting:** The process of positioning climbing holds, and/or climbing volumes, on the surface of a manufactured climbing structure in order to create a sequence of movements for a climber.
- 3.4.11 **Route Forerunning:** Climbing a set route for the purposes of determining climbing hold placement, climbing hold sequence and to establish the climbing route grade and overall function.

4 Employer Duties and Responsibilities

4.1 Written Hazard Assessment

- 4.1.1 The employer shall verify that a written Hazard Assessment has been performed by a Qualified Climbing Wall Worker or other qualified person.

4.2 Written Hazard Protection Plan

- 4.2.1 The employer shall develop a written Hazard Protection Plan, including a Fall Protection Plan, in accordance with the requirements of Section 6 of this document. The employer shall ensure all employees understand, comply with, and have sufficient training to follow the Hazard Protection Plan. Organizations are responsible to develop and maintain written hazard protection policies and procedures for every work-at-height location or operation.

4.3 Written Rescue Plan

- 4.3.1 Organizations are responsible for developing and maintaining written rescue policies and procedures for every work-at-height location or operation.

4.4 Provide or Designate Appropriate Personal Protective Equipment (PPE)

- 4.4.1 The employer shall select and provide or designate required PPE for work-at-height. Employer-owned equipment must be maintained in a sanitary and reliable condition. Personal protective equipment includes ascenders, braking devices, connectors, descenders, fall arrestors, harnesses, helmets, lanyards, and lifelines. Personal protective equipment also includes equipment for eyes, face, head, hearing and extremities, protective clothing, shields or barriers, or respiratory devices necessary to protect workers. Where workers provide their own equipment, the employer is responsible for insuring it is adequate, appropriate, it fits and is properly inspected, maintained and stored.

4.5 Training

- 4.5.1 The employer shall ensure its workers understand their roles and responsibilities and have the proper knowledge and training necessary to execute their respective roles in the Hazard Protection Plan, Fall Protection Plan, Rescue Plan, and in the use of selected or approved PPE. Employees must be trained when PPE is necessary, how to use PPE, the limitations of the PPE and how to inspect, maintain, care for and store PPE.

4.6 Documentation, Record Keeping and Accessibility of Records

- 4.6.1 The employer shall maintain up-to-date written documentation of the Hazard Assessment, the Fall Protection Plan and the Rescue Plan.

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- 4.6.2 The employer shall maintain adequate records for PPE used in the facility, per the manufacturers' instructions, including: manufacturers' product information, equipment selection and purchase, equipment use, equipment storage, equipment maintenance, equipment repair (if appropriate), equipment inspection and retirement.
- 4.6.3 The employer shall maintain adequate records for employee training for work-at-height operations and the use of PPE.
- 4.6.4 The employer shall maintain adequate records for periodic structural inspection, periodic maintenance, and, if and where appropriate, instructions for repair of structures, structural components, and associated equipment per the CWA Specification for the Structural Inspection of Artificial Climbing Structures or the code of local adoption.
- 4.6.5 The employer shall ensure that all documentation and quality assurance records are accessible to employees.

5 Hazard Assessment

5.1 General Requirements

- 5.1.1 A Qualified Climbing Wall Worker, or other qualified person, shall conduct a hazard assessment at the workplace to determine if fall hazards, or other hazards associated with work-at-height, exist. If fall hazards or other workplace hazards exist, a Qualified Climbing Wall Worker, or qualified person, shall document these hazards, determine which hazards can be eliminated or controlled, develop appropriate controls, select or designate required Personal Protective Equipment, and notify Climbing Wall Workers of the foreseeable fall hazards, other foreseeable hazards, controls, and required PPE prior to working at height.
- 5.1.2 The written Hazard Assessment shall include the date of the assessment, the qualified person conducting the assessment and the workplace assessed.

6 Fall Protection Plan (FPP)

6.1 General Requirements

- 6.1.1 Prior to preparing fall protection procedures, a hazard assessment shall be performed and a written report prepared for every workplace activity where authorized persons are exposed to a fall hazard.
- 6.1.2 Written fall protection procedures are required whenever one or more authorized persons are routinely exposed to any fall hazard while using active fall protection including travel restraint, positioning, suspension, fall arrest and/or attended belay systems. The written fall protection procedures shall be site and/or task specific except where the same procedures can be effectively applied to multiple tasks or workplaces.
- 6.1.3 Written fall protection procedures shall specify the method of access, fall protection equipment and systems used to protect authorized persons from each fall hazard and shall document the proper way to use the specified fall protection equipment and systems, including installation, inspection, use, dismantling and storage.
- 6.1.4 Written fall protection procedures shall provide for 100% continuous fall protection and shall be prepared and modified only by their organization's qualified person or competent person(s).
- 6.1.5 Written fall protection procedures for restraint, positioning, suspension, fall arrest and attended belay systems may include:
- *Identification of acceptable anchorages and connection techniques;*
 - *clearance requirements of the system;*
 - *complete setup procedure for access;*
 - *proper use of the system;*
 - *limitations on use of the system; and*
 - *free fall distance and total fall distance.*

7 Rescue Plan

7.1 Written Rescue Procedures

7.1.1 Written rescue procedures shall be prepared and maintained by a Qualified Climbing Wall Worker for all activities or locations where competent and authorized persons work at height. Such procedures shall contain provisions for the prompt rescue of any worker who falls. Rescue procedures may include provisions for self-rescue, assisted rescue and/or technical rescue by emergency services. A rescue procedure may be a separate document or may be included as a separate section of the Fall Protection Plan.

7.2 Rescue Requirements

- 7.2.1 Contact with the rescue subject (communication or physical contact) should occur as soon as possible after the fall and within six minutes.
- 7.2.2 The organization shall provide for prompt rescue of all fallen workers incapable of self-rescue. What constitutes “prompt rescue” can vary depending on the circumstances and the code of local adoption. The hazards identified in the hazard assessment should determine rescue planning and resources available on site.
- 7.2.3 The back side of the climbing wall may be considered a confined or restricted space. Special consideration should be given to confined space rescue per the code of local adoption.

7.3 Rescue Training

7.3.1 Workers shall be trained in the rescue procedures, consistent with their role, as prescribed by the employer.

8 Equipment and Systems

8.1 Compatibility

- 8.1.1 The chosen fall protection equipment and fall protection system shall be compatible and be appropriate for the method of access.

8.2 Selection and Application of Travel Restraint and Fall Protection Systems

- 8.2.1 **Hazard Assessment and Risk Management.** A Qualified Climbing Wall Worker shall consider the risks of each task or operation and design a program that identifies the equipment, training, systems and rescue protocols to reasonably address the risks of each task or operation. The equipment and systems used for each task or operation must comply with all of the relevant directives in this standard.
- 8.2.2 **Travel Restraint Systems.** A Qualified Climbing Wall Worker shall consider a travel restraint system for work tasks where an unprotected edge fall hazard is present. Examples of this work include work on ledges, platforms or other walking working surfaces at height, such as those used to instruct ‘top of cliff’ skills.
- 8.2.3 **Positioning Systems.** A Qualified Climbing Wall Worker shall consider a positioning system where the worker needs a stable, hands free work position or stance. While positioning, a person is exposed to a fall hazard and is required under these standards to use a separate system that provides protection from the fall. Examples of this work include a routesetter on a suspension system using a lanyard to position himself or herself under a roof.
- 8.2.4 **Suspension Systems.** A Qualified Climbing Wall Worker shall consider a suspension system for work tasks where hands free work is done at height, such as ascending or descending an anchored rope while routesetting. The suspension system components are not designed to arrest a free fall; therefore, the suspension system should be under tension.
- 8.2.5 **Fall Arrest Systems.** A Qualified Climbing Wall Worker shall consider a fall arrest system for work tasks where there is a risk of free fall greater than allowed by the code of local adoption (i.e. 2 feet in the USA or 0.6 meters in Canada). Examples of this work may include climbing wall structural inspection or t-nut replacement behind the wall. A Qualified Climbing Wall Worker should design the Fall Arrest System to limit the force transmitted to the worker consistent with the code of local adoption.
- 8.2.6 **Attended Belay Systems.** A Qualified Climbing Wall Worker shall consider an attended belay system for work tasks that require full mobility using rock climbing equipment such as route forerunning or tightening a handhold. Attended belaying may be used for either top-rope or lead climbing applications.
- 8.2.7 **Auto Belay Systems.** A Qualified Climbing Wall Worker shall consider an auto belay system for work tasks that require full mobility using rock climbing equipment such as route forerunning or tightening a handhold.

8.3 Anchors

- 8.3.1 **Restraint and Travel Restraint Anchors.** Restraint and travel restraint anchors shall be capable of supporting the lesser of 4.5 kN, or twice the anticipated load, in the direction of loading per user.
- 8.3.2 **Positioning, Suspension and Attended Belay Anchors.** Positioning, Suspension and attended belay anchors shall be capable of supporting the lesser of 13.3 kN, or twice the anticipated load, in the direction of loading per user.
- 8.3.3 **Fall Arrest Anchor.** Fall arrest anchors shall be capable of supporting the lesser of 22.2 kN, or twice the anticipated load, in the direction of loading per user.
- 8.3.4 **Rescue Anchor.** Rescue anchors shall be capable of supporting the lesser of 13.3 kN, or five times the applied load, in the direction of loading per user.

8.4 Access Methods

- 8.4.1 **Access Methods in Combination.** Access methods may be used in combination to secure the climbing wall worker at height.
- 8.4.2 **Portable Ladders.** The employer must provide one or more appropriate points of access to elevated work positions, this point of access may be a portable ladder.
 - 8.4.2.1 *Ladders must be of the appropriate type and rating for the environment and work to be performed.*
 - 8.4.2.2 *All ladders must be used according to the labels, markings or instructions on the ladder. Ladders must not be loaded beyond the manufacturer's rated capacity and must be placed according to mandated placement, surface and pitch requirements.*
 - 8.4.2.3 *When ladders are not placed on stable level surfaces they must be secured or stabilized to prevent accidental displacement in accordance with the code of local adoption.*
- 8.4.3 **Mobile Elevating Work Platforms.** The employer may provide mobile elevating work platforms (MEWPs) of various types to access elevated work positions.
 - 8.4.3.1 *All mobile elevating work platforms must be used according to the labels, markings, instructions, rescue planning, training and record-keeping requirements prescribed by the manufacturer or required by the local code of adoption.*
 - 8.4.3.2 *MEWPs must not be loaded beyond the manufacturer's rated capacity, and must be placed, secured and or stabilized according to mandated placement, surface and pitch requirements prescribed by the manufacturer or required by the code of local adoption.*
 - 8.4.3.3 *Mobile elevated work platforms must be of the appropriate type and rating for the environment and work to be performed.*
 - 8.4.3.4 *Workers must use a restraint or fall arrest system when using a mobile elevated work platform, per the manufacturer's instructions.*

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- 8.4.4 **Structure Climbing.** The employer may allow structure climbing to access an elevated work position such as the back of the manufactured climbing wall. A fall arrest or suspension system must be used at all times (see 6.2.4 and 6.2.5). A positioning or suspension system may be used to facilitate hands free work (see 6.2.3 and 6.2.4).
- 8.4.5 **Rope Systems.** The employer may allow rope systems to be used to access elevated work positions. Rope systems include an anchor point above the highest anticipated work location. The rope or ropes may be terminated at the high point, near ground level, or at the user. These systems are primarily used for ascending, suspension, descending, and fall arrest.
- 8.4.6 **Route Forerunning.** The employer may allow route forerunning to access elevated work positions. This access method allows for testing and adjusting the arrangement of climbing holds on a climbing route using the equipment and methods of recreational climbing. Forerunning systems allow a climbing wall worker to simulate a rock climb while bouldering or roped climbing. The climbing wall worker may climb above the anchor using a UIAA approved sit harness and UIAA dynamic rope. This system may be used with an attended belay, an auto belay and/or positioning and suspension systems. The worker must not be exposed to fall distances greater than the fall distances experienced by recreational climbers.

8.5 Equipment

- 8.5.1 All equipment shall be used in accordance with the manufacturer's instructions for use, including instructions regarding care, storage, inspection and retirement. Components used in any system must be compatible with one another.
- 8.5.2 **Helmets.** Helmets must incorporate a chin strap and meet the requirements of ANSI Z89.1, CSA Z94.1, EN 12492, EN 397, or equivalent in accordance with the code of local adoption.
- 8.5.3 **Harnesses**
- 8.5.3.1 *Restraint/Positioning/Suspension/Attended Belay Harness* - shall meet the requirements of UIAA 105, EN 813, EN 12277 or equivalent in accordance with the code of local adoption.
- 8.5.3.2 *Fall Arrest Harness* - a full body harness meeting the requirements of ANSI Z359.11, CSA Z259.1, EN 361 or equivalent in accordance with the code of local adoption shall be used where fall arrest systems are employed.
- 8.5.4 **Lanyards**
- 8.5.4.1 *Restraint/Work Positioning Lanyard* Restraint or work positioning lanyards may be fixed length or adjustable and shall meet the requirements of ANSI Z359.3, CSA Z259.11-05, EN 358 or equivalent in accordance with the code of local adoption.
- 8.5.4.2 *Fall Arrest/Energy Absorbing Lanyard* – Fall arrest or energy absorbing lanyards shall meet the requirements of ANSI Z359.13, CSA Z259.11-05, EN 355 or equivalent in accordance with the code of local adoption.

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- 8.5.5 **Connectors.** Connectors (e.g. carabiners) shall meet UIAA 121, EN 362, EN 12275, CSA Z259.12 or equivalent in accordance with the code of local adoption. Carabiners used to connect a lanyard or device (e.g. ascender, descender, fall arrestor etc.) to a harness shall be of a locking type.
- 8.5.6 **Descenders.** Descenders shall meet EN 341 or equivalent in accordance with the code of local adoption and shall allow for controlled descent and braking, and shall enable the user to stop and work hands-free.
- 8.5.7 **Ascenders.** Ascenders shall meet UIAA 126, EN 567, or equivalent in accordance with the code of local adoption.
- 8.5.8 **Braking Device.** Braking devices shall meet UIAA 129 or EN 15151-1, or equivalent in accordance with the code of local adoption.
- 8.5.9 **Ropes.** Ropes shall be of kernmantle construction and meet UIAA 101, UIAA 107, EN 892, EN 1891, or equivalent in accordance with the code of local adoption.
- 8.5.10 **Eye Protection.** Eye Protection shall meet ANSI Z87.1, CSA Z94.3 or equivalent in accordance with the code of local adoption. Eye protection shall be worn where hazards to eyesight exist.
- 8.5.11 **Hearing Protection.** Hearing protection may be required when employees are exposed to noise levels that exceed certain limits, under these circumstances hearing protection must be provided and used to reduce the sound to acceptable levels in accordance with the code of local adoption.

ANNEX A – Referenced Documents

ANSI Standards

ANSI/SAIA A92.2 - 2015 Vehicle-Mounted Elevating and Rotating Aerial Devices

ANSI/SIA A92.3-2006 Manually Propelled Elevating Aerial Platforms

ANSI/SIA A92.5-2006 Boom-Supported Elevating Work Platforms

ANSI/SIA A92.6-2006 Self-Propelled Elevating Work Platforms

ANSI/ISEA Z89.1-2014 American National Standard for Industrial Head Protection

ANSI Z133-2012 Safety Requirements for Arboricultural Operations

ANSI/ASSE Z359.0-2012 Definitions and Nomenclature Used for Fall Protection and Fall Arrest

ANSI/ASSE 359.1-2007 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ANSI/ASSE 359.2-2007 Minimum Requirements for a Comprehensive Managed Fall Protection Program

ANSI/ASSE 359.3-2007 Safety Requirements for Positioning and Travel Restraint Systems

ANSI/ASSE Z359.4-2013, Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

ANSI/ASSE 359.11-2014 Safety Requirements for Full Body Harnesses

ANSI/ASSE Z359.14-2014 Safety Requirements for Self-Retracting Devices for Personal Fall Arrest & Rescue Systems

CSA Group Standards

CAN/CSA-B354.1-04 (R2016) - Portable Elevating Work Platforms

CAN/CSA-B354.2-01 (R2013) - Self-Propelled Elevating Work Platforms

CAN/CSA-B354.4-02 (R2013) - Self-Propelled Boom-Supported Elevating Work Platforms

CAN/CSA-C225-10 (R2015) - Vehicle-mounted aerial devices

CAN/CSA Z94.1-05 Industrial Protective Headwear

CAN/CSA Z94.2-14 Hearing protection devices, performance, selection, care, and use

CAN/CSA Z94.3-15 Eye and face protectors

CAN/CSA Z259.1-05 Body Belts for Work Positioning and Travel Restraint

CAN/CSA Z259.2.2-14 Self-retracting devices

CAN/CSA Z259.2.3-16 Descent devices

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CAN/CSA Z259.2.5-12 Fall Arresters and Vertical Lifelines

CAN/CSA Z259.10-12 Full body harnesses

CAN/CSA Z259.11-17 Personal energy absorbers and lanyards

CAN/CSA Z259.12-16 Connecting components for personal fall arrest systems

CAN/CSA Z259.15-12 Anchorage Connectors

CAN/CSA Z271-10 Safety code for suspended platforms

Climbing Wall Association Standards

CWA Specification for the Structural Inspection of Artificial Climbing Structures, 1st Edition, March 2009.

EN Standards

EN 280:2013+A1:2015 - Mobile elevating work platforms. Design calculations. Stability criteria. Construction. Safety. Examinations and tests

EN 341:2011 Personal fall protection equipment. Descender devices for rescue

EN 355:2002 Personal protective equipment against falls from a height. Energy absorbers

EN 361:2002 Personal protective equipment against falls from a height. Full body harnesses

EN 362: 2004 Personal protective equipment against falls from a height. Connectors

EN 397:2012+A1:2012 Industrial safety helmets

EN 567:2013 Mountaineering Equipment. Rope clamps. Safety requirements and test methods

EN 795:2012 Personal fall protection equipment. Anchor devices

EN 813:2008 Personal fall protection equipment. Sit harnesses

EN 892:2012 Mountaineering Equipment. Dynamic mountaineering ropes. Safety requirements and test methods

EN 1891:1998 Personal protective equipment for the prevention of falls from a height. Low stretch kernmantle ropes

EN 12275:2013 Mountaineering equipment. Connectors. Safety requirements and test methods

EN 12277:2015 Mountaineering equipment. Harnesses. Safety requirements and test methods

EN 12492:2012 Mountaineering equipment. Helmets for mountaineers. Safety requirements and test methods

EN 12841: Personal fall protection equipment. Rope access systems. Rope adjustment devices

EN 15151-1:2012 Mountaineering equipment. Braking devices. Braking devices with manually assisted locking, safety requirements and test methods

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ISO Standards

ISO 16368:2010 - Mobile elevating work platforms -- Design, calculations, safety requirements and test methods

ISO 18893:2014 - Mobile elevating work platforms — Safety principles, inspection, maintenance and operation

ISO 18878:2013 - Mobile elevating work platforms — Operator (driver) training

OSHA Standards

29 CFR 1910 OSHA

OSHA Publication 3124-12R 2003 Stairways and ladders, a guide to OSHA rules

SPRAT Standards

SPRAT Safe Practices for Rope Access Work

UIAA Standards

UIAA 101 Ropes

UIAA 105 Harnesses

UIAA 106 Helmets

UIAA 107 Low stretch ropes

UIAA 121 Connectors

UIAA 126 Rope clamps

UIAA 129 Braking devices

ANNEX B – Fall Protection Requirements by Country

Canada

Canada Occupational Health and Safety Regulations (SOR/86-304)

A worker at risk of falling certain distances must be protected by a fall-protection system. Fall protection must be used when workers work

- 1) from an unguarded structure or on a vehicle, at a height of more than 2.4 m above the nearest permanent safe level or above any moving parts of machinery or any other surface or thing that could cause injury to a person on contact;
- 2) from a temporary structure at a height of more than 6 m above a permanent safe level; or
- 3) from a ladder at a height of more than 2.4 m above the nearest permanent safe level where, because of the nature of the work, that person is unable to use at least one hand to hold onto the ladder.

United States of America

OSHA requires that fall protection be provided at elevations of four feet in general industry workplaces, five feet in shipyards, six feet in the construction industry and eight feet in longshoring operations. In addition, OSHA requires that fall protection be provided when working over dangerous equipment and machinery, regardless of the fall distance.

ANNEX C – Hearing Protection Requirements by Country

Canada No employee in a work place shall, in any 24 hour period, be exposed to:
 (a) an A-weighted sound pressure level set out in column I of the schedule for a duration of exposure exceeding the applicable duration set out in column II, or
 (b) a noise exposure level (Lex 8) that exceeds 87 dBA.

Maximum Duration of Exposure to A-Weighted Sound Pressure Levels in the Work Place	
A-Weighted sound pressure level (dBA)	Maximum duration of exposure in hours per employee per 24 hour period
87	8.0
88	6.4
89	5.0
90	4.0
91	3.2
92	2.5
93	2.0
94	1.6
95	1.3
96	1.0
97	0.80
98	0.64
99	0.50
100	0.40
101	0.32
102	0.25
103	0.20
104	0.16
105	0.13
106	0.10
107	0.080

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108	0.064
109	0.050
110	0.040
111	0.032
112	0.025
113	0.020
114	0.016
115	0.013
116	0.010
117	0.008
118	0.006
119	0.005
120	0.004

USA

When employees are exposed to noise levels that exceed 85 decibels averaged over 8 working hours, or an 8-hour time weighted average (TWA), hearing protection must be provided and used to reduce the sound to the acceptable levels of the table.

Permissible Noise Exposure	
Duration in hours per day.	Sound level dBA slow response.
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
.5	110
.25 or less	115