# NOTE TO REVIEWERS

This document is part of project BSR/ACCT 03-202X. It contains proposed revisions to ANSI/ACCT 03-2019, *Challenge Courses and Canopy / Zip Line Tour Tours Standards.*

**Public Review Period:** April 17, 2026 to 11:59 pm MDT on June 1, 2026

**Project Need:** Revise standards to enhance consistency in terminology, structure, and application, with integration of evolving industry practices and technological developments.

**Purpose of Public Review:** The purpose of the Public Review is to provide an opportunity for directly and materially affected parties to review and comment on the proposed American National Standard.

In accordance with the American National Standards Institute Essential Requirements: "Participation shall be open to all persons who are directly and materially affected…"

Public Review is a critical component of ANSI due process and is intended to ensure:

- Openness and transparency
- Consideration of all views and objections
- Development of consensus

**Reading the Draft:** In reviewing the document,

- Existing text is shown in black,
- Additions are shown in red text, and
- Deletions are shown with a ~~strikethrough~~.

**Explanatory Materials:** Explanatory materials (including explanatory notes, annexes, and definitions) which have previously been published alongside the American National Standard (ANS), and rationale for the proposed revisions are available in a separate document that can be downloaded from the Public Review Page on the ACCT International website at https://www.acctinfo.org/03-202X-Comments.

**Submitting Comments:** For instructions on commenting and to submit comments, visit the Public Review Page on the ACCT International website at https://www.acctinfo.org/03-202X-Comments.

# CHAPTER 1

# DESIGN, PERFORMANCE, AND INSPECTION (DPI)~~STANDARDS~~

## A. GENERAL REQUIREMENTS

**A.1. Scope**: ~~The ANSI/ACCT 03-2019 Standards:~~ The Design, Performance, and Inspection Chapter~~Standards~~ (hereinafter referred to as "DPI ~~Standard~~") establishes requirements for the design, performance, and inspection of elements and associated life safety equipment for

- Challenge Courses,
- Aerial Adventure/Trekking Parks,
- Canopy Tours, ~~and~~
- Zip Line Tours

(hereinafter referred to as "courses").

**A.2. Purpose:** The purpose of this Chapter~~DPI Standard~~ is to:

- Represent a consensus of vendors, field practitioners, and any person with a direct and material interest
- Define minimum acceptable practices
- Establish sound structural design criteria while allowing for design creativity
- Establish assessment and interpretation criteria for professional inspection
- Standardize interpretation through explanatory material providing rationale or additional information
- Provide an acceptable industry standard for adoption by jurisdictional regulatory bodies

### A.3. General Principles

**A.3.1. Mandate:** It is mandated throughout this Chapter~~DPI Standard~~ that a course, its components, and equipment be designed by a qualified person and be manufactured and inspected by a competent person.

**A.3.2. Critical Components and Systems:** A qualified person shall determine when components and systems are to be considered critical. Special design and engineering consideration shall be given to individual critical components and systems where the consequence of failure is likely to lead to serious injury and/or death.

**A.3.2.1.~~E.1.2.~~ System Integrity for Critical Components and Systems:** Life safety systems shall be installed according to the designer or manufacturer instructions and integrity shall be assured in one or more of the following ways:

- **Proof Testing:** A non-destructive static test load equivalent to two times the expected load shall be applied simulating operational conditions of the system. The system is deemed to comply if no permanent deformation or displacement in anchorage or components results from the application of this load.
- **Specification Verification:** The components that make up the system are manufactured using an accepted, applicable and verifiable quality assurance process.
- **Redundancy:** A backup (redundant component or system) is implemented that has the same safety factor as that of the primary system.

**A.3.3.~~B.2.2.~~ Access and Evaluation:** The designer, manufacturer, and/or inspector shall determine methods of evaluation for acceptance inspections, professional inspections, periodic internal monitoring, and pre-use checks. When an evaluation method requires ~~that the inspector~~ access to a component, a safe means of access shall be available. ~~A component shall not pass inspection until it has met evaluation requirements.~~

## A.4. Application

**A.4.1.** New course installations completed after the publication date of this ~~DPI~~ Standard shall comply with the requirements of this edition of ~~the DPI Standard~~this Chapter.

**A.4.1.1.** The manufacturer shall provide the owner a document upon commissioning certifying that the course meets all the requirements of this Chapter~~DPI Standard~~ and that it is ready for participant use.

**A.4.1.2.** Upon completion of a new element or course, the manufacturer shall provide the owner with a clear written description of its operation, at minimum including:~~the following to the owner regarding its operation:~~

- Normal operation and limitations
- Operational instructions and participant safety briefing procedures
- Recommended rescue procedures (for harnessed activities)
- Maintenance, inspection and life safety equipment replacement criteria
- Identification of critical components and systems
- For zip lines, brake system operational limits and reasonably anticipated hazards

**A.4.1.3.** An acceptance inspection shall be completed prior to commissioning for ~~on~~ a new element or course, or major modification to a pre-existing element or course ~~prior to commissioning~~. Criteria are established in Chapter 1, B: Inspection Requirements.~~Section B. "Inspection Requirements".~~

**A.4.1.4.** Commissioning of a new element or course or of a major modification to a pre-existing element or course shall be performed by a competent person and shall include owner and/or operator orientation, turnover, and sign-off.

**A.4.2.** Pre-existing element and course modifications completed after the publication date of this ~~DPI~~ Standard shall comply with the requirements of this edition of this Chapter~~the DPI Standard~~.

**A.4.2.1.** P~~On p~~re-existing elements and courses may continue to use previously compliant~~, "grandfathering" of~~ materials and techniques ~~is allowable~~ only when such materials and techniques comply with the strength and performance requirements of the current edition of this Chapter~~the DPI Standard. Non-compliant systems that have a history of reliability shall be given a grace period of twenty-four (24) months from the publication date of this DPI Standard to comply.~~

**A.4.3.** New innovations and alternative materials used in elements and completed after the publication date of this ~~DPI~~ Standard shall comply with the strength and performance requirements of this edition of ~~the DPI Standard~~this Chapter.

**A.4.3.1.** When a designer or manufacturer proposes to deviate from ~~this~~the requirements of this Chapter ~~DPI Standard~~ and use alternative materials or designs, those materials or designs shall be clearly identified. Design and test information shall be provided to the owner. Properly designed structures that cannot be fully evaluated using this Chapter~~DPI Standard~~ and have been reviewed and stamped by a licensed professional engineer may be deemed structurally acceptable.

**A.4.4.** ~~The DPI Standard~~ This Standard may be superseded by regulations for design and operation of courses applied by the authority having jurisdiction.

## B. INSPECTION REQUIREMENTS

### B.1. Types and Frequency of Inspection

**B.1.1. Acceptance Inspection:** An acceptance inspection shall be completed prior to commissioning a new element or course, or for a major modification to~~of~~ a pre-existing element or course. This inspection shall be performed by the installer or a qualified third party. An acceptance inspection may include testing of system(s) prior to commissioning and the creation of a deficiency list. The test shall be defined in advance and the expected results shall be quantified prior to the test.

**B.1.2. Professional Inspection:** A professional inspection by a qualified person (hereinafter named "inspector") is required at an interval specified by the designer, manufacturer, or other qualified person. At a minimum this inspection shall be done annually.

**B.1.2.1.** The designer, manufacturer, or other qualified person shall determine inspection frequency by considering the design of the systems, the number of participant cycles, and extent of environmental impact.

**B.1.3. Periodic ~~Internal~~ Monitoring:** The organization shall implement and document an on-going system of monitoring all components at an interval specified by the designer, manufacturer, or other qualified person.

### B.2. Professional Inspection Process

**B.2.1.** A professional inspection shall include a visual and physical inspection of low elements, high elements, associated life safety ~~system~~ equipment, and the condition of the environment around each element.

**B.2.2.** The designer, manufacturer, and/or inspector shall determine methods of evaluation. ~~When an evaluation method requires that the inspector access to a component, a safe means of access shall be available.~~ A component shall not pass inspection until it has met evaluation requirements.

**B.2.3.** The strength of elements and structures shall be evaluated by applying accepted engineering practice for appropriate resistance to live loads and dead loads for the material under consideration (e.g. wood, steel, concrete).

**B.2.4.** In the absence of other supporting information, the inspector may deem proof testing or engineering analysis necessary to properly assess the strength and suitability of the design.

**B.2.5.** Inspectors shall consult other qualified persons when issues or questions arise that fall outside the inspector's scope of expertise.

**B.2.6.** Inspectors shall communicate to the owner any physical conditions that indicate improper use of elements and equipment.

**B.2.7.** The inspector shall ~~immediately~~ notify the operator or its designee as soon as practicable during the inspection ~~owner~~ when element(s) or life safety equipment fail inspection, or if there is a finding that significantly impacts ~~the safety of the~~ system integrity. The inspector shall inform the operator or its designee~~owner~~ that items which have failed inspection are to be immediately removed from service.

### B.3. Documentation for Professional Inspections

**B.3.1.** Professional inspections shall be documented in a written report and furnished to the owner within a reasonable time subsequent to the inspection.

**B.3.1.1. Required Information:** The following information shall be included in the written report:

- Inspection date(s)
- Inspection company and inspector name(s)
- Course installation history if available, including the original installation dates, manufacturer or entity name, and details of subsequent modifications and additions
- Previous inspection information if available, including the inspection entity name and date of the inspection
- A list of elements inspected
- A list of elements not inspected (if known) and explanation for omission
- Condition of each element at the time of inspection including a grade authorizing or prohibiting its use in that condition
- Concerns warranting continued observation which may be of a critical nature
- A list of life safety ~~system~~ equipment inspected
- A list of life safety ~~system~~ equipment not inspected and explanation for any omissions when apparent
- The condition of each piece of life safety ~~system~~ equipment at the time of the inspection including a grade authorizing or prohibiting its use in that condition

## C. SITE CONSIDERATIONS

### C.1. Element Location

**C.1.1.** Element(s) shall be located with consideration given to their intended use and be clear of known hazards in the immediate area of the element when operated as designed and intended. Access for emergency response and rescue shall be considered as a factor in the location of the elements.

**C.1.2.** Building and zoning codes and regulations for the authority having jurisdiction shall be followed.

**C.1.3. Access Limitation:** The need to limit unauthorized access to elements ~~by unauthorized personnel~~ shall be evaluated by a qualified person for each element, course, or site. ~~for each element, course, or site by a qualified person.~~ Where there is a likelihood of injury due to unauthorized access by ~~an unauthorized user~~, site and situation appropriate steps shall be ~~should be~~ taken to identify, warn, or physically limit access to the element or course.

## D. ELEMENT SUPPORT STRUCTURES

### D.1. General Requirements

**D.1.1.** A qualified person shall design element support structures with consideration given to all live and dead loads so the entire system, including all constituent components, operate within the working load limit required by accepted engineering practice for the material used.

### D.2. Trees

**D.2.1. Strength:** Trees shall be selected based upon the expected load from element(s) and associated structures, including environmentally induced loads, multiplied by an appropriate safety factor determined by a qualified person. A qualified person shall determine the suitability of trees required to support the expected load and the need for supplementary support from guy systems.

**D.2.2. Environmental Considerations:** Element installation and maintenance in live trees shall be performed in a manner that minimizes damage to support trees and the surrounding environment.

**D.2.3. Inspection and Evaluation:** A tree inspection and evaluation shall be conducted by a qualified person.

**D.2.3.1.** The inspector may deem verification necessary to properly assess the strength and integrity of a system.

**D.3. Poles and Columns**

**D.3.1. Strength:** A qualified person shall specify poles or columns based on the expected load and safety factor required by accepted engineering practice for the material used.

**D.3.2. Material Requirements:** When specifying poles or columns that support elements, the designer shall consider environmental factors, location, anticipated life span, compatibility of materials, etc.

**D.3.3. Wood Poles:** Wood poles used as critical element support structures shall comply with prevailing editions of the American National Standard for Wood Products — Specifications and Dimensions (ANSI 05.1) or Structural Glue Laminated Timbers for Utility Structures (ANSI 05.2) or equivalent in the jurisdiction of use.

**D.3.3.1. Fastener Placement:** Fasteners for lifelines, guys ~~cables~~, anchorages, or other critical components that penetrate wood poles shall be installed at least 300 mm ~~twelve~~ (12~~)~~ inches~~)~~ ~~(305 mm)~~ from the top of an unprotected pole, including a laminated pole, unless there is supplementary protection from the deterioration that normally occurs in this part of a pole.

**D.3.3.2. Inspection and Evaluation:** On wood poles, the inspector shall visually inspect for vertical checks and through-splits, horizontal cracks, decay pockets, shakes, shell rot, and other defects that may affect pole strength and integrity. Additional consideration shall be made for potential ground line decay, pole top degradation or shrinkage that may result in loosening of hardware. Sub-grade inspection shall be done on older poles or poles in high stress environments using techniques and at intervals determined by a qualified person.

**D.4. Guy Systems**

**D.4.1. Strength:** Guys ~~cables~~ (excluding ground anchors or footings) shall have the same safety factor as the lifeline(s) that they support and be based on the expected load in the guys ~~cable~~.

**D.4.2. Design Considerations:** Guy systems shall be designed by a qualified person. The designer shall consider the relative support provided by structure, guys, and the interaction between them.

**D.4.3. Material Requirements:** When designing guy systems, the designer shall consider the following: environmental conditions, location, anticipated life span, and compatibility of materials.

**D.4.4. Ground Anchors:** The head of the ground anchor or connecting link shall extend above the ground. The anchor shall be installed per manufacturer's specifications and recommendations. Variations from the installation specifications for any reason shall be considered by a qualified person when specifying the anchor. Accepted engineering practice shall be followed in the verification of the anchor's holding capacity.

**D.5. Critical Guy Systems**

**D.5.1. Determination:** A qualified person shall determine if guy components and systems are to be considered critical.

**D.5.2. Performance:** Critical guy systems shall meet all applicable systems integrity requirements of Chapter 1, A.3.2.1 ~~the life safety systems standard (DPI Standard Section E).~~

**D.5.3. Proof Testing Requirements for Critical Ground Anchors:** With the exception of engineered footings or structures (e.g. formed concrete), a qualified person shall proof test newly installed critical guy ground anchors to a minimum of two times the expected load following accepted engineering practice for testing.

**D.5.3.1.** Proof tests shall be applied in the direction of the expected load and follow manufacturer's recommended procedures. A soils investigation is required when the anchor's capacity relies on soil conditions.

**D.5.3.2.** Proof tests shall be performed and documented by a competent person. Test documentation shall be part of commissioning documents supplied to the owner.

**D.5.4. Inspection and Evaluation:** Guy system and ground anchor inspection shall include evaluation of design, operational load in the guy(s), anchorages and connectors, ground anchor placement, all constituent components, and an assessment of any material defect, stress deformity, corrosion, pitting, erosion, ground movement, ground uplift, etc.

**D.5.4.1. Verification:** In the absence of supporting information, the inspector may require proof testing of existing ground anchors to properly assess their strength and suitability. Proof tests on existing ground anchors shall be done according to ~~DPI Standard~~ Chapter 1, D.5.3. The inspector may, at their~~his or her~~ discretion, alternatively recommend the installation of a redundant system that shall be installed according to ~~DPI Standard~~ Chapter 1, D.4. and tested according to ~~DPI Standard~~ Chapter 1, D.5.3.

### D.6. Existing Buildings and Structures

**D.6.1. Structural Suitability:** Assessment of the suitability of existing buildings or structures for element support shall be performed by a qualified person.

**D.6.2. Inspection and Evaluation:** Inspection and evaluation of elements on existing buildings and structures shall be performed by a qualified person and shall include investigation of structural integrity, element location, expected loads, and an assessment of any deflection, ~~and/or~~ deformation, and/or cracking in any structural member supporting an element. ~~If any cracks or deformation are found, remedial action is required.~~

## E. LIFE SAFETY SYSTEMS

### E.1. General Requirements

**E.1.1. Life Safety System Design/Installation:** Life safety systems shall be engineered systems or be designed by a qualified person and be manufactured and/or installed by a competent person

**E.1.2. System Integrity:** Life safety systems shall be installed according to the designer or manufacturer instructions and meet all applicable requirements of Chapter 1, A.3.2.1. ~~integrity shall be assured in one of the following ways:~~

- ~~Proof Testing: a non-destructive static test load equivalent to two times the expected load shall be applied simulating operational conditions of the system. The system is deemed to comply if no permanent deformation or displacement in anchorage or components results from the application of this load.~~
- ~~Specification Verification: The components that make up the system are manufactured using an accepted, applicable and verifiable quality assurance process.~~
- ~~Redundancy: A backup (redundant component or system) is implemented that has the same safety factor as that of the primary system.~~

### E.2. Lifeline Systems

**E.2.1. Performance Criteria:** Lifeline systems that are not engineered systems shall comply with all of the following:

- Be designed and specified by a qualified person
- Be appropriately flexible
- Be resistant to wear, fatigue, and environmental degradation
- Be designed and installed in a manner that allows for inspection along the entire length of the lifeline system
- Be accompanied by the lifeline rope material manufacturer's inspection and test certification or documentation

- Be accompanied by the designer's, manufacturer's, and/or inspector's criteria for future routine maintenance, inspection, testing, and replacement
- For synthetic fiber rope and webbing, meet the rope and webbing requirements of ~~the DPI Equipment Standard~~ Chapter 1, I.3.11.1.~~ (Rope and Webbing)~~

**E.2.2. Vertical Lifeline Strength:** Vertical lifeline systems including terminations, anchorage(s), anchorage connectors, and backups shall be capable of supporting a minimum load of 22kN (5,000 lbf)~~ (22.2 kN)~~ without failure or shall be designed to a minimum lifeline system breaking strength of two times the expected load as determined by a qualified person. One participant is permitted at any one time on each vertical lifeline during normal operations.

**E.2.3. Horizontal Lifeline Strength:** Horizontal lifeline systems including terminations, anchorage(s), anchorage connectors, and backups shall be designed to a minimum rated breaking strength of five times the expected load (safety factor of 5:1) as determined by a qualified person.

**E.2.3.1.** A horizontal lifeline safety factor of not less than 3:1 shall be allowable for wire rope lifeline assemblies of minimum rated breaking strength greater than 100 kN (22,500 lbf) only if the design has been reviewed and stamped by a licensed professional engineer. The lifeline assembly includes the termination strength reduction factor (efficiency).~~A horizontal lifeline safety factor of not less than 3:1 shall be allowable for wire rope lifelines of nominal diameter greater than ½" (12.7 mm) or die-compressed (swaged) wire rope of nominal diameter of 12mm or greater only if the design has been reviewed and stamped by a licensed professional engineer.~~

**E.2.4. Inspection and Evaluation:** Inspection of both metallic and non-metallic rope used in lifelines shall include an assessment of the entire span, including termination points, operational wear and fatigue points. The designer, manufacturer, and/or inspector shall determine if and when additional non-destructive test methods are required in order to assess the integrity of the wire rope.

**E.2.4.1.** A wire rope lifeline shall be retired from service when any one of the following occurs:

- The reduction in nominal diameter due to tension, wire breaks, surface wear, metal loss, or corrosion amounts to 5% or more from the diameter measured under tension at commissioning.
- The crown (surface) wires are worn by approximately 1/3 or more of their diameter
- There are 6 or more broken wires in one lay
- There are 3 or more broken wires in one strand in one lay
- There are 1 or more broken wires within one wire rope diameter of an attached fitting due to fatigue

**E.2.4.2.** Lifeline system integrity shall be assessed based on the appropriateness of the termination (application) and negative effects from overloading, loss of wire/fiber rope cross-sectional area, corrosion, wear, UV exposure, kinks, core exposure, broken wires, electrical damage, vibratory fatigue damage, terminations that are cracked, worn or deformed, etc.

**E.2.5. Intermediate Anchorages or Connectors:** An intermediate anchorage or connector used on a lifeline shall meet the strength requirement of the applicable standard and be designed to mitigate the potential of fatigue or other damage to the lifeline.

**E.2.6. Terminations**

**E.2.6.1. Materials and Processes:** Termination materials and techniques are permitted only when it can be demonstrated by testing or documentation that all requirements of ~~the life safety system standard~~ Chapter 1, A.3.2.1.are met and~~, additionally, that~~ the durability, reliability, and other properties pertinent to the intended use(s) have been evaluated and determined suitable by a qualified person.

**E.2.6.1.1. Wire Rope Clips**

**E.2.6.1.1.1. Material:** Wire rope clips shall conform to US Federal Specification number FF-C-450, EN 13411-5, or equivalent standard in the jurisdiction of use.

**E.2.6.1.1.2. Inspection and Evaluation:** Wire rope clip terminations shall be inspected for appropriateness of the termination (application) and negative effects from broken wires at the turn of the eye (if no thimble is present), corrosion, deformities, poor thread condition, nicking damage, etc.

**E.2.6.1.2. Swaged Fittings**

**E.2.6.1.2.1. Material:** Swaged fittings used to fabricate eyes or splices in wire rope shall be created using ferrules (oval sleeves) that conform to US Military Standard MS51844E,
EN 13411-3, or equivalent standard in the jurisdiction of use and shall be from a material that is compatible with that of the wire rope.

**E.2.6.1.2.2. Inspection and Evaluation:** Swaged fittings shall be inspected for appropriateness of the termination (application), the number of ferrules employed and negative effects from broken wires at the turn of the eye (if no thimble is present), corrosion, deformities such as cracks and splits, quality of crimps, amount of compression, and material compatibility.

**E.2.6.1.3. Automatic Deadends**

**E.2.6.1.3.1.** Automatic deadends shall be fitted with a redundant system equal in strength to the expected load of the cable system plus applicable safety factor for the cable system. Automatic deadends shall be ~~and~~ configured to prevent connection failure resulting from release (slippage) of wire rope through the device and/or resulting from bail failure on automatic deadends.

**E.2.6.1.3.2. Inspection and Evaluation:** Automatic deadends shall be inspected for appropriateness of the termination (application), defects, signs of wire rope release or slippage, appropriate size and type, defects and deformities in the connector, and strength of the backup.

**E.2.6.2. Terminations in non-metallic Rope and Webbing**

**E.2.6.2.1. Allowable Techniques:** Lifeline terminations in non-metallic rope and webbing shall be specified by a qualified person and created by a competent person. Acceptable termination methods include stitching, splices, knots, bends, and hitches.

**E.2.6.2.2. Inspection and Evaluation:** Non-metallic rope and webbing terminations shall be assessed for integrity based on the appropriateness of the termination (application) and negative effects from wear, abrasion, kinks, cuts, broken fibers, discoloration, the effect of UV exposure, age, and chemical contamination.

**E.2.7. Backup Loops:** All backup loops shall be sufficiently taut to minimize fall distance should the primary connection fail. Any backup loops around trees shall be sufficiently loose to prevent damage to the tree surface. ~~and sufficiently taut to minimize participant fall distance should the primary connection fail.~~

**E.3. Belay Beams**

**E.3.1. General Requirements**

**E.3.1.1. Belay Beams shall:**

- Be designed and specified for the intended use by a qualified person and have appropriate levels of rigidity, resistance to wear, fatigue, and environmental degradation
- Be accompanied by manufacturer's criteria for maintenance, inspection, testing, and replacement

- Be designed and configured to prevent excessive belay rope wear

**E.3.2. Strength:** A qualified person shall specify belay beams based on the expected load(s) plus safety factor required by accepted engineering practice for the material and installation techniques used.

~~**E.3.2.1.** Minimum beam strength supporting multiple belay loads shall be calculated with one person load equal to 2,250 lbf (10.0 kN) and each additional person load equal to 675 lbf (3.0 kN). The formula for computing the minimum overall capacity of a beam in pounds is {(n –1) 675 + 2,250} and in pounds is {(n-1_ 675+2,250} where n equals the maximum number of person loads.~~

E.3.2.1. Minimum beam strength supporting multiple belay loads shall be calculated with one person load equal to 10.0 kN (2,250 lbf) and each additional person load equal to 3.0 kN (675 lbf).

Formula for computing the minimum overall capacity of a beam

*n* equals the maximum number of person loads

- Using kilonewtons (kN): 3.0(*n*-1) + 10.0
- Using pounds (lbf): 675(*n*-1) + 2,250

**E.3.2.2.** For unfixed anchorages along the beam (such as on belay pipes), the above loads shall be assumed to be 5 feet (1520 mm) apart and as close to mid-span as possible. The resultant of the belay load(s) shall take into account the resolved angle possibilities as illustrated in Diagrams E.3.2.2.a and E.3.2.2.b.

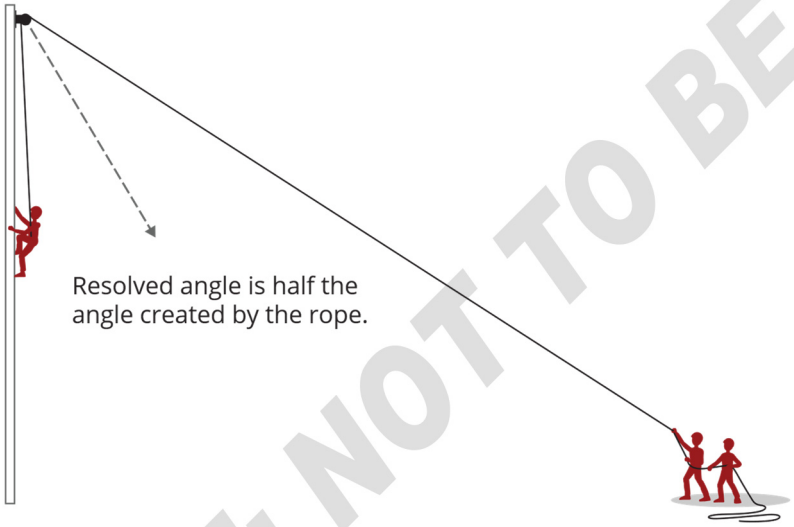


**Diagram E.3.2.2.a**

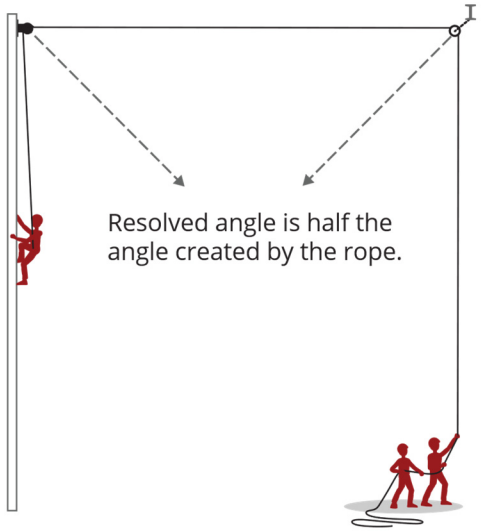


**Diagram E.3.2.2.b.**

**E.3.3. Inspection and Evaluation:** The inspector shall assess belay beam integrity by taking into consideration deflection or yielding and shall also include scrutiny of welds, connecting hardware, suspension components, damage or defects resulting from wear, abrasion, surface corrosion (rust, pitting, etc.), and corrosion of metal components.

## E.4. Anchorages

**E.4.1. Strength:** Installed anchorages shall be capable of supporting a load of at least 22 kN (5,000 lbf) ~~(22.2 kN)~~ per climber attached without failure or two times the expected load on the anchorage without causing permanent displacement in the anchorage or its components. The expected load shall be determined by a qualified person. This requirement does not apply when anchorages are components of an assembly in an engineered system.

### E.4.2. Inspection and Evaluation

**E.4.2.1. Engineered Anchorages:** Inspectors shall follow the manufacturer's inspection and replacement policies regarding application and retirement.

**E.4.2.2. Bolt, Beam Clamp, and Bracket Anchorages:** Inspection shall include an assessment for integrity based on the appropriateness of the termination (application), proper installation, fastener torque, negative effects from deflection, distortion, wear in the clamp, or bolt, or its connecting components, rust, corrosion, pitting that may affect the ability of the clamp or bolt to support the expected load, quality of welds, and misalignment with the expected load.

**E.4.2.3. Concrete or Rock Anchorages:** Inspection shall include an assessment of the anchorage, the embedment material and the substratum. As many components of expansion or chemical anchorages cannot be visually inspected, the inspector shall rely on external signs of deterioration and one of the methods outlined in Chapter 1, A.3.2.1.~~the system integrity standard (DPI Standard E.1.2.).~~ The inspector shall assess anchor system integrity based on negative effects from corrosion, wear, yielding, cracking, fracturing or crumbling of embedment material, looseness of any anchorage component that cannot be corrected, pullout or movement of anchorage components, and age of anchorage components (relating to possible deterioration of internal components).

**E.4.2.4. Screw Anchorages in Wood Products:** Inspection shall rely on external signs of deterioration and one of the methods outlined in Chapter 1. A.3.2.1.~~the system integrity standard (DPI Standard E.1.2.).~~ The inspector shall assess anchor system integrity based on the negative effects from damage due to cracks or decay in the wood around the screw, severe nicks, gouges, excessive wear or abrasion, pitting or corrosion, and tree growth that interferes with the operation of the anchor system. Conditions warranting increased scrutiny include visible yielding of the screw or anchorage, looseness of the screw in the wood, or evidence of heat damage and/or discoloration (potential causes include lightning strikes or fire).

**E.4.2.5. Rope and Webbing Slings:** Inspection shall include assessment of the anchor system integrity based on the negative effects from wear, improper terminations, improper positioning or movement of the sling under load, flattening, stiffening, distortion of wires or strands, stitching integrity, signs of overloading or excessive load, and distortion or wear on structural components supporting the sling.

## E.5. Ground Belay Anchor Systems

### E.5.1. Primary

**E.5.1.1. Strength:** Ground anchor systems used as anchorage for a primary belay system shall be capable of supporting two times the expected load as determined by a qualified person.

**E.5.1.2. Inspection and Evaluation:** Embedded logs or posts used as primary ground belay anchors shall be categorized and inspected as critical anchorages. When used as the belay device (e.g. a belay post), they shall also be inspected for proper belay function. The inspector shall assess anchor system integrity based on the negative effects from looseness of the post or of anchorages~~,~~ or anchorage connectors; ~~,~~ rot or decay; ~~,~~ material defects; or damage and surface conditions that may cause damage to rope or other belay system components.

### E.5.2. Secondary

**E.5.2.1. Strength:** Ground anchor systems used for maintaining belayer position or providing additional support to the belayer when belaying from a harness shall be capable of supporting the expected load as determined by a qualified person.

**E.5.2.2. Inspection and Evaluation:** The inspector shall verify that the belay anchor is appropriately configured and of sufficient mass or strength to perform as intended and shall assess anchor system integrity based on the negative effects from damage or defect to any component.

# F. ELEMENT SUPPORT SYSTEMS

## F.1. General Requirements

**F.1.1. Strength:** Element support systems shall be capable of supporting two times the expected load without causing permanent displacement in the system. The expected load shall be determined by a qualified person.

**F.1.1.1.** Critical element support cables systems shall be designed to a minimum rated breaking strength of five times the expected load (safety factor of 5:1) as determined by a qualified person.

**F.1.2. Material Requirements:** When specifying structural components, including all installation hardware and lumber products, the designer shall consider environmental conditions, location, anticipated life span, and compatibility of materials.

**F.1.3. Performance Criteria:** The quality and reliability of materials shall be consistent with application and performance expectations. Critical element support systems shall meet all the applicable system integrity requirements of Chapter 1, A.3.2.1.~~DPI Standard Section E (Life Safety Systems).~~

**F.1.4. Inspection and Evaluation:** The inspector shall apply the same criteria as those found in Chapter 1, ~~Section~~ E, ~~(~~Life Safety Systems~~)~~ for assessing and evaluating the specific materials used in element support systems.

# G. PLATFORMS

## G.1. General Requirements

**G.1.1. Strength:** The strength of platforms and associated components shall be determined by a qualified person applying accepted engineering practice for appropriate resistance to live and dead loads and consideration to the required capacity of the platform.

**G.1.2. Design Considerations:** A collective safety system (e.g., g~~G~~uardrails and handrails) shall not be required when individuals are required to be connected to a life safety system.

**G.1.2.1.** When platforms, including collective safety systems (e.g., guardrails and handrails), are classified by a qualified person to be critical~~life safety systems~~, the criteria found in Chapter 1, A.3.2.1.~~DPI Standard Section E (Life Safety Systems)~~ in specifying materials, components, and systems shall be applied.~~ This classification may be either direct or indirect through a connection to another life safety system (e.g. on the primary load path).~~

**G.1.3. Inspection and Evaluation:** The inspector shall visually assess the supports, frame, joists, decking, and fasteners used in platform construction and assess platform integrity based on the negative effects from rot and wood degradation, component defects and deformities, and overgrowth. The inspector shall additionally assess platform size and strength, construction materials and preservatives, and any other potential hazard or environmental impact.

# H. ZIP LINE SYSTEMS

**H.1. Brake System:** All zip lines shall be designed and installed with an integrated brake system.

## H.1.1. General Requirements

**H.1.1.1** The Brake System shall:

- Limit the deceleration of the participant so as to prevent a hazard to the participant
- Be capable of repeated operation without permanent deformation, undue wear, or failure of any associated components or equipment

- Arrest the motion of the participant regardless of participant orientation
- Not inhibit the participant retrieval procedure in the event that arrest occurs before the zip line landing area is reached

**H.1.2. Design Considerations:** Brake Systems shall be designed by a qualified person. At minimum, the~~The~~ design shall address the following:

- Arrest as a critical function that meets all applicable requirements of Chapter 1, A.3.2.1.
- Static, dynamic, and impact loads in worst-case situations
- Resistance to wear and fatigue with consideration given to the anticipated use
- Environmental factors such as extreme temperatures, wind, and weather conditions
- The level of risk to the participant posed by the failure of the brake system or any of its components, including potential for pinching, binding, entanglement, etc.

**H.1.3. Emergency Brake Requirements:** An emergency brake shall require no action by the participant and shall either be completely separate from the primary brake or an integrated backup feature of the primary brake. An emergency brake shall be required if, upon failure of the primary brake, both of the following may occur:

- The participant arrives at the zip line landing area at a speed in excess of 10 km/h (6 mph)~~ (10 kph)~~
- The participant experiences unintended and/or harmful contact with terrain, objects or people in the zip line landing area

**H.1.4. Test Requirements:** A qualified person shall design the methods, oversee the performance, and assess the results of operational tests.

**H.1.4.1.** The following circumstances require testing of the brake systems by a competent person to determine proper system operation:

- Prior to commissioning of the zip line
- Whenever a brake system or component is disassembled and reassembled, changed, added, or replaced.

**H.1.4.2.** All tests shall provide proof of the following:

- Brake system operational characteristics at the extremes of the design continuum for participant weight and arrival speed
- Confirmation that the brake system performs reliably and as designed

**H.1.5. Inspection and Evaluation:** Zip line brake systems shall be evaluated according to the manufacturer's specifications as included in the documentation provided at the time of installation.

**H.2. Zip Line Landing Areas shall:**

- Provide sufficient space for brake system operation and dismount procedures
- Prevent potentially harmful contact with zip lines, people, and other components with consideration given to participant orientation
- Be free from hazards that require participant action to avoid. Objects in the zip line landing area that have the potential to harm participants shall be covered with shock absorbing material adequate for the anticipated impact

**H.3. Collision Mitigation:** The designer or qualified person shall specify appropriate means to reasonably mitigate the risk of collisions by defining rider launch procedures until the zip line and corridor are clear.

# I. EQUIPMENT

**I.1. Scope:** ~~This standard e~~Establishes requirements for life safety ~~system~~ equipment (hereinafter referred to as 'equipment') used as part of the operation of a course by participants.

**I.2. General Principles**

**I.2.1. ~~Understanding and Interpreting the Standard (Systems Approach):~~** Courses may use equipment assembled into systems of components (hereinafter referred to as 'system') to achieve a variety of purposes. As such, systems may include belay systems, tensioned rope~~rope rigging~~ systems, personal safety systems, and fall arrest systems. Unless specific editions of ~~other~~ standards are referenced, the current edition shall be used.

**I.3. Application**

**I.3.1. Selection Criteria for Equipment**

**I.3.1.1. Design Considerations:** When creating operating~~equipment~~ systems, the qualified person shall consider the actual loads at various locations in these systems as well as conditions that may reduce the strength of components or adversely impact their performance.

**I.3.1.2. Compatibility:** Individual pieces of equipment within a given operating system shall be compatible with other pieces of equipment in the system and shall not adversely affect the performance of the system.

**I.3.1.2.1.** Equipment shall meet all applicable requirements of Chapter 1, A.3.2.1.

**I.3.1.3. Limitations:** Strength and performance requirements of this standard are limited to equipment that is being used to support or arrest the fall of a single person. Higher breaking strengths or different performance criteria shall be specified by a qualified person when designing systems for multi-participant or rescue-level loads.

**I.3.1.4. Guidelines for Use of Equipment:** A qualified person shall specify equipment components and systems and shall document limitations of use if different from original equipment manufacturer guidelines.

**I.3.2. Inspection and Evaluation - General**

**I.3.2.1. Inspection:** Equipment shall be inspected at intervals specified by the manufacturer or qualified person for correct operation and function. Supporting information may include date of purchase, use logs, and other records as applicable.

**I.3.2.2. Retirement:** Retirement of equipment shall be determined by a qualified person in accordance with ~~DPI Standard~~ Chapter 1, I.3.1

**I.3.2.2.1. Metallic Materials:** In the absence of manufacturer's guidance, retirement shall be based solely on an evaluation of wear, deformation, cracking, weld anomalies and assessment of its general condition.

**I.3.2.2.2. Synthetic Materials:** Manufacturer's instructions and equipment implementation shall be referenced in determining synthetic material retirement. It is the inspector's responsibility to gather information regarding equipment purchase and/or implementation dates.

**I.3.2.3.** If the inspector is unfamiliar with a piece of equipment or its manufacturer, they~~he/ she~~ may choose to disclaim responsibility for that item of equipment and refer the client to the equipment supplier or manufacturer. In the instance of the inspector disclaiming responsibility for the item of equipment, the inspector shall issue a disclaimer statement to the owner.

### I.3.3. Personal Safety Systems

**I.3.3.1. Strength:** A personal safety system shall be designed with a minimum rated breaking strength of 15 kN (3,375 lbf) ~~(15.0 kN)~~.

**I.3.3.2. Freefall Limitation:** The potential free-fall shall be limited to no more than 600 mm (2 feet) ~~2'- 0" (610 mm)~~.

**I.3.3.3. Compatibility:** Individual components within a personal safety system shall be functionally and operationally compatible with all other components inof the personal safety system. Compatibility shall be determined by a qualified person and may require manufacturer guidance.

### I.3.4. Belay Systems and Tensioned Rope ~~Rigging~~ Systems

**I.3.4.1. Strength:** Belay systems and tensioned rope ~~rigging~~ systems shall be designed so that the minimum breaking strength of the system is five times the expected load (safety factor of 5:1). The expected load shall be determined by a qualified person.

**I.3.4.2. Impact Force:** Belay system and tensioned rope ~~rigging~~ system components shall be selected to minimize the arrest force on the participant and prevent unintended contact with the ground or other hazards.

**I.3.4.3. Compatibility:** Individual components within a belay or tensioned rope ~~rigging~~ system shall be functionally and operationally compatible with all other components in the system. Compatibility shall be determined by a qualified person and may require manufacturer guidance.

### I.3.5. Connectors on Equipment Systems

**I.3.5.1. Design Requirements:** Carabiners, snap hooks, and rapid links shall have a minimum rated breaking strength of 22 kN (5,000 lbf) ~~(22.2 kN)~~.

**I.3.5.2. Material Requirements:** Connectors that traverse (slide) on uncoated wire rope under load shall have wear resistant (toughness) characteristics equivalent to that of the steel on the contact surface.

**I.3.5.3. Quality Assurance:** Connectors shall meet the requirements of and be compliant with any one of the following: ANSI Z359.12, CSA Z259.12, EN 12275, EN 362, NFPA 2500~~1983~~, ~~or~~ UIAA 121, or other applicable standard in the jurisdiction of use. ~~When used as part of a fall arrest system or other mechanical safety system, the connector shall meet the requirements of one of the following standards: ANSI Z359, ANSI A14.3, CSA Z259, EN 12275, EN 362, or other applicable standard in the jurisdiction of use.~~

**I.3.5.4. Inspection and Evaluation:** The inspector shall assess the severity of any degradation on the integrity of the connector. The inspector shall assess connector integrity with consideration given to scoring, cracking, corrosion, area reduction, material incompatibility, defect in gate operation, hinge, locking mechanism, and deformation.

### I.3.6. Lanyards

**I.3.6.1. Strength:** Lanyards shall have a minimum rated breaking strength of 22 kN (5,000 lbf) ~~(22.2 kN)~~ for fall arrest systems and 15 kN (3,375 lbf) ~~(15.0 kN)~~ for personal safety systems. Knots are allowable so long as the strength requirement is met and they are tied by a competent person.

**I.3.6.2. Quality Assurance:** Material used for lanyards in life safety systems shall comply with Chapter 1, I.3.11.1. ~~the requirements of DPI Standard I.3.11.1.~~

**I.3.6.3. Inspection and Evaluation:** Inspection of lanyards shall include an assessment of knots, splicing, and stitching; strength reduction from the termination; condition of the energy (shock) absorber, lanyard material, and metallic components (including built in connectors or buckles); age; and use.

### I.3.7. Pulleys

**I.3.7.1. Strength in a Belay System:** Pulleys used as part of a belay system for an individual participant shall have a minimum rated breaking strength of 22 kN (5,000 lbf) ~~(22.2 kN)~~ or five times the expected load as determined by a qualified person.

**I.3.7.2. Strength when part of a Personal Safety System:** Pulleys used as part of a personal safety system for an individual participant shall have a minimum rated breaking strength of 15 kN (3,375 lbf) ~~(15.0 kN)~~ or five times the expected load as determined by a qualified person.

**I.3.7.3. Strength in a Tensioned Rope ~~when part of a Rope Rigging~~ System:** Pulleys used as part of a tensioned rope ~~rigging~~ system to support individuals participants shall have a minimum rated breaking strength of 15 kN (3,375 lbf) ~~(15.0 kN)~~ or two times the expected load as determined by a qualified person.

**I.3.7.4. Material Requirements:** Pulley sheaves shall be compatible with the other components with which they are used.

**I.3.7.5. Quality Assurance:** Pulleys used on elements shall meet the requirements of either the UIAA 127, EN 12278, or NFPA 2500 ~~1983~~ standard or be approved for use by a qualified person. Interlocking lanyards with integrated pulleys shall meet the requirements of EN 17109.

**I.3.7.6. Inspection and Evaluation:** Inspection shall include an assessment of the following: operation of moving parts; defects or damage to metallic components including scoring or grooving; loose or damaged bearings or bushings; damage to the axle or fasteners; and corrosion. The inspector shall assess the pulley's integrity and suitability for use.

### I.3.8. Belay Devices and Descent Control Devices

**I.3.8.1. Performance Requirements:** Belay devices and descent control devices shall meet the requirements of NFPA 2500 ~~1983~~, UIAA 129, ISO 22159, ~~or~~ EN 341, EN 15151, or ANSI Z359.9.

**I.3.8.2. Inspection and Evaluation:** Inspection shall include an assessment of the following: presence of significant scoring, grooving, wear, or sharp edges; damage or defects; and improper operation of moving parts. The inspector shall assess the impact on the performance of the device from any problems found.

### I.3.9. Shear Reduction Devices

**I.3.9.1. Application:** A shear reduction device should be used for dynamically belayed diving/leaping elements or other activities with similar dynamic features.

**I.3.9.2. Strength:** Shear reduction devices shall have a minimum rated breaking strength of 22 kN (5,000 lbf) ~~(22.2 kN)~~.

**I.3.9.3. Inspection and Evaluation:** Inspection shall include an assessment of the following: presence of significant scoring, grooving, wear, or sharp edges that may damage the belay line; damage or defects; proper operation of moving parts; and corrosion. The inspector shall assess the shear reduction device's integrity and suitability for use.

### I.3.10. Vertical Fall Arresters (Rope/Cable Grabs)

**I.3.10.1. Selection:** Vertical fall arresters shall be selected by a qualified person and be compatible with the host lifeline. When selecting a vertical fall arrester, consideration shall be given to its ability to effectively arrest a fall when used in combination with other system components (e.g. harness type and attachment location, shock absorber, etc.).

**I.3.10.2. Performance Requirements:** Vertical fall arresters shall be of a type that prevents accidental detachment from the rope. Vertical fall arresters shall meet the requirements of one of the following standards: ANSI Z359.16, ANSI A14.3, CSA Z259.2.5, EN 353-2, or other equivalent standard in the jurisdiction of use.

**I.3.10.3. Inspection and Evaluation:** Inspection shall include an assessment of the following on the performance of the device: damage and defects; grooving and wear; and improper operation of hinge/locking mechanisms.

### I.3.11. Rope and Webbing

**I.3.11.1. Performance Requirements:** Rope and webbing used as part of a life safety system shall be of a type specifically designed for life safety use.

**I.3.11.1.1. Dynamic Rope** shall meet UIAA 101 or EN 892 or be approved by the manufacturer for belaying a single person.

**I.3.11.1.2. Low Stretch Rope and Static Rope** shall meet one or more of the following standards: UIAA 107, NFPA 2500~~1983~~, EN1891 (Type A), ~~or~~ CI 1801, or CI 1805 or be approved by the manufacturer for belaying a single participant.

**I.3.11.1.3. Webbing (tape)** shall have a minimum rated breaking strength of five times the expected load as determined by a qualified person.

**I.3.11.1.4. Accessory Cord** for use in an equipment system shall meet either UIAA 102, EN 564, or CI 1803, and be compatible with other system components, and~~AND~~ shall meet the system performance requirements in which it is employed.

**I.3.11.2. Inspection and Evaluation:** Inspection shall include assessment of rope or cordage integrity with consideration given to wear, cuts, discoloration, or glazing; stiffness, softness, or inconsistency; change in diameter or bend radius; unknown or suspect history; age; and use.

### I.3.12. Harnesses

**I.3.12.1. Type:** Manufactured sit, sit/chest, full body, or tied harnesses are acceptable for use by participants on courses. Harnesses shall be selected by a qualified person to be appropriate for the activity and intended use.

**I.3.12.2. Fit:** Harnesses shall be correctly sized and fitted based on the age, size, and body type of the individual.

**I.3.12.3. Strength:** Harnesses used as part of belay, tensioned rope ~~rigging~~, or personal safety systems shall have a minimum breaking strength of 15 kN (3,375 lbf) ~~(15.0 kN)~~ when oriented as designed. Harnesses used as part of fall arrest system shall have a minimum breaking strength of 22 kN (5,000 lbf) ~~(22.2 kN)~~ when oriented as designed.

**I.3.12.4. Quality Assurance:** Harnesses shall meet performance, construction and testing requirements of: UIAA 105, EN12277, ANSI Z359.11, ASTM F1772, CSA Z259.10, NFPA 2500~~1983~~, EN 361, EN 813, or other applicable standards or be approved for use by a qualified person.

**I.3.12.5. Inspection and Evaluation:** Inspection shall include an assessment of webbing and stitching, belay/rappel loops, and any metallic components including built in D-rings or buckles. The inspector shall assess harness integrity with consideration given to damage to the webbing material or stitching; discoloration or deformity of the webbing material; defective or deformed metallic components; age; and use.

### I.3.13. Helmets

**I.3.13.1.** A qualified person shall determine whether a helmet is required and the standard the helmet shall meet. Relevant Standards may include: UIAA 106, EN~~CE~~ 12492, EN 397, ANSI Z89.1 or CSA Z94.1.

**I.3.13.2. Inspection and Evaluation:** Inspection shall include assessment of the shell, absorption material, suspension system and fasteners, and buckles. The inspector shall assess helmet integrity with consideration given to fractures or other damage to the shell; damaged or defective absorption material including mold and mildew; defective suspension system; corrosion on metallic fasteners; broken or defective buckles; strap material condition; age; and use.

# CHAPTER 2

# OPERATION ~~STANDARDS~~

## A. GENERAL REQUIREMENTS

**A.1. Scope:** The Operation Chapter~~The ANSI/ACCT 03-2019 Standards: Operation Standards (hereinafter referred to as "Operation Standard")~~ establishes minimum operational procedures and staff competencies for courses. ~~Challenge Courses, Aerial Adventure/Trekking Parks, Canopy Tours and Zip Line Tours (hereinafter referred to as "courses").~~

**A.2. Purpose:** The purpose of this Chapter~~section~~ is to establish a set of requirements~~standards~~ that:

- Define the critical skills and knowledge necessary for management, programmatic, and technical operation of a course
- Designate core, technical, and interpersonal/program management staff competencies for a course
- Elevate the level of quality and enhance professional practices in all course programming
- Promote better risk management practices associated with operating a course
- Represent a consensus of leading practitioners, managers, vendors, or any person with a direct and material interest in the field
- Allow for creativity in design and implementation of programs while ensuring effective operations
- Apply to all facilities and operations using Chapter 1~~the DPI Standard~~ for the construction, maintenance, and inspection of the facility

### A.3. General Principles

**A.3.1.** This is Chapter is organized into:~~e Operation Operation Standard is organized into two sections~~:

- **Operations Management:** Philosophy & Ethics, Administration, and Human Resource Management.
- **Staff Competencies:** Core, Technical, and Interpersonal/Program Management Competencies are general headings with applicable sub-sections organized by Delivery Approach as shown in the table below:

| Delivery Approach | Definition | ~~Including but not limited to:~~Examples of Courses including: | ~~Typical technical operating systems~~Example Operating Systems |
|---|---|---|---|
| Facilitated | Participants engage in an adventure-based learning experience designed to lead toward particular outcomes. Trained staff are responsible for safety and the group's learning process. | ~~Traditional~~ Challenge Courses | • Spotted<br>• Top Rope Belay, including Team Belay<br>• ~~Team Belay~~<br>• Personal Safety System (Lanyards)<br>• Tensioned Rope ~~Rigging~~ System (e.g. Rappelling/Abseiling)<br>• ~~Rappel Belay~~ |

| | | | |
|---|---|---|---|
| Guided | Participants engage in a set tour escorted by trained personnel who directly supervise (i.e. close enough to physically intervene) participant actions. Trained staff are responsible for safety and may provide educational programming. | ~~Zip Line Tour~~<br>Canopy Tours and Zip Line Tours | • Personal Safety System (Lanyards)<br>• Tensioned Rope ~~Rigging~~ System (e.g. Rappelling/Abseiling and Zip Lines)<br>• ~~Rappel Belay~~ |
| Self-Guided | Participants engage in an adventure-based experience & are able to select their own route or elements. Trained staff monitor safety and do not directly supervise (i.e. are not close enough to physically intervene) participant actions. | Aerial Adventure/ ~~Park~~<br>Aerial Trekking Parks | • Personal Safety System (Lanyards)<br>• Collective Safety Systems<br>• Tensioned Rope ~~Rigging~~ System<br>• Mechanical Descent Auto-Belay |

### A.4. Application

**A.4.1.** This Chapter~~The Operation Standard~~ should be taken as a whole. However, some ~~standards~~requirements may not apply to specific programs or practitioners, depending upon such variables as: type of program, client profile, type of course, or other site-specific conditions.

**A.4.2.** The competencies outlined in this Chapter~~these standards~~ do not necessarily need to be held by every individual staff member. The intent is that these competencies are present in the staff body as a whole during all programming. These competencies may be possessed by an individual or a team of individuals and are expressed in three forms:

- Knowledge of a topic: familiarity, awareness, or understanding gained through experience or study.
- Demonstrated ability: the act of showing or performing a particular skill at a particular time.
- Mastery of skills and knowledge: possession of full and current command of particular skills and/or area of knowledge.

## B. OPERATIONS MANAGEMENT

### B.1. Philosophy and Ethics

**B.1.1.** *This item is intentionally left blank.*

**B.1.2.** The organization shall represent itself, and market its products and services, accurately to the public.

**B.1.3.** The organization shall meet mandated codes of conduct with respect to employee's and client's rights and confidentiality.

**B.1.4.** The organization and its staff shall operate within the bounds of their organizational and individual competencies.

**B.1.5.** The organization shall follow applicable laws and regulations.

**B.1.6.** The organization shall have knowledge of and conduct operations in accordance with applicable local, regional, and national environmental guidelines.

### B.2. Administration

**B.2.1.** The organization shall have a risk management system in place that addresses the identification, mitigation, and

ongoing monitoring of reasonably foreseeable risks to the organization, its staff, and its participants.

**B.2.2.** The organization shall maintain written records for a period of time which takes into account statutes of limitations pertaining to claims under pertinent laws.

**B.2.3.** The organization shall maintain professional inspection reports for at least the life of each specific element.

**B.2.4.** The organization shall have adequate written policies, procedures, and/or practices that establish minimum acceptable criteria for all course operations.

**B.2.5.** The organization shall have a written plan in place for the reasonable management of emergencies.

**B.2.5.1.** The organization shall have onsite, when participants are present, a person trained in basic first aid and CPR.

**B.2.6.** The organization ~~should~~shall maintain appropriate types and amounts of insurance coverage for each location in which they operate.

**B.2.7.** The organization shall engage in a review of its practices by an external qualified person(s), at least once every five (5) years.

**B.2.8.** The organization shall ensure a qualified person is responsible for administrative and operational decisions.

**B.2.9.** The organization shall maintain written documentation of an acceptance inspection for all new installations and major modifications.

**B.2.10.** The organization shall have its course(s) inspected by a qualified inspector annually or more frequently as specified by the designer, manufacturer or other qualified person.

**B.2.11.** The organization shall take appropriate actions based on the results and recommendations of an inspection report provided by a qualified inspector.

**B.2.12.** The organization shall conduct and document periodic internal monitoring of its course and equipment as designed by the manufacturer or a qualified person.

**B.2.13.** The organization shall ensure a pre-use check is conducted for each course ~~element and associated related equipment~~ according to a written checklist. The pre-use check shall be developed by the designer, manufacturer, installer, or qualified person and the check shall be documented prior to participant use.

**B.2.13.1.** For zip lines, the pre-use check shall include one full cycle, or as recommended by the original equipment manufacturer, by staff prior to operations with participants to assess sufficiently the condition and functionality of the activities and the zip line(s).

**B.2.14.** Critical maintenance items discovered during periodic~~in-house~~ monitoring and pre-use checks which pose an immediate risk to participants or staff shall be documented.

**B.2.15.** Critical maintenance items documented during periodic~~in-house~~ monitoring and pre-use checks shall be addressed.

**B.2.16.** Remediation of critical maintenance items shall be documented.

**B.2.17.** The organization shall have a policy for assessing and confirming that activity corridors are clear of obstructions and hazards before each and every participant starts the activity.

**B.2.18.** The organization shall have an appropriate participant screening process.

**B.2.19.** Prior to participation, the organization shall inform participants of the existence of inherent and other risks of course activities, describing a sampling of risks.

**B.2.20.** The organization shall have a written participant supervisory plan.

**B.2.21.** The organization shall have written, site-specific procedures for all activities or types of activities.

**B.2.22.** The organization shall have a system in place for incident documentation.

**B.2.23.** The organization shall perform an annual analysis of all incident documentation. Findings shall be documented in writing, including any remedial measures or changes implemented.

**B.2.24.** The organization should take appropriate measures to provide access to basic amenities for staff and participants.

**B.2.25.** The organization shall operate each course element according to the original equipment manufacturer and/or qualified person's recommended procedures regarding and not limited to capacities, weights, and number of participants.

**B.2.26.** Where courses are used in dark or low light environments the organization shall:

- Provide appropriate lighting of all takeoff and landing areas
- Provide personal light or reflective material on each participant
- Provide lighting at all exit and entry areas or any other areas necessary for operations
- Provide sufficient emergency lighting to facilitate evacuation in the event of an emergency or a power failure

### B.3. Human Resource Management

**B.3.1.** The organization shall have employment policies in place.

**B.3.2.** The organization shall have a means of communicating employment policies to staff.

**B.3.3.** The organization shall define adequate, minimum qualifications for all staff.

**B.3.4.** The organization shall have an appropriate screening process in place for staff.

**B.3.5.** The organization shall maintain a current personnel file for each staff member.

**B.3.6.** The organization shall have a system in place for training staff and volunteers in necessary skills and competencies, beyond those skills of initial employment, and all training shall be documented.

**B.3.7.** The organization shall conduct annual or more frequent staff assessments on core, technical, and interpersonal/program management competencies necessary to conduct course operations.

**B.3.8.** *This item is intentionally left blank*

**B.3.9.** The organization shall have a system in place for supervising and monitoring the performance of all staff.

**B.3.10.** The organization shall maintain documentation of agreements with independent contractors and staff.

## C. STAFF COMPETENCIES

**C.1. Core Competencies** are fundamental to operations and possessed by each staff member.

**C.1.1.** *This item is intentionally left blank.*

**C.1.2.** Staff shall operate within the limits of their technical and interpersonal/program management skill level.

**C.1.3.** Staff shall know and understand ~~ACCT Operation Standards~~Chapter 2: Operation requirements applicable to their job assignment.

**C.1.4.** Staff shall have knowledge of venue and specific activities appropriate to their job duties.

**C.1.5.** Staff shall know duty relevant participant information.

**C.1.6.** Staff shall understand and maintain client confidentiality.

**C.1.7.** Staff shall follow original equipment manufacturer's recommendations and/or local operating procedures to determine appropriate staff-to-participant ratios for activities.

**C.1.8.** Staff shall be capable of initiating and implementing the organization's emergency action plan.

**C.1.9.** Staff shall follow organizational policies and procedures for restrictions, limitations and participant screening. At minimum, ~~This should~~this shall include~~ and is not limited to~~:

- Weight, age, height, and/or medical conditions
- Intoxication
- Dress and footwear requirements
- Physical limitations
- Element capacity
- Weather and environmental conditions

**C.1.10.** Staff shall know and implement site-specific first aid procedures.

**C.1.11.** Staff shall know and communicate activity associated inherent risks to participants.

**C.1.12.** Staff shall follow the original manufacturer and/or vendor recommended course use procedures regarding capacities, weights, and maximum simultaneous participants.

**C.2. Technical Competencies** refer to management of physical safety and may not necessarily be possessed by all staff or at the same level of expertise.

**C.2.1. General** (applicable to all operating systems)

**C.2.1.1.** Staff shall recognize risks which are inherent in each activity.

**C.2.1.2.** *This item is intentionally left blank.*

**C.2.1.3.** Staff shall conduct activities according to the organization's guiding policies, procedures, and practices.

**C.2.1.4.** Staff shall conduct and document a ~~reasonably~~ thorough, periodic ~~in-house~~ monitoring of its own course ~~and equipment~~ including at a minimum: ~~and not limited to~~ life safety systems, activity support structures and life safety equipment. This monitoring may be completed by a qualified third party.

**C.2.1.5.** Staff shall conduct a pre-use check for each course~~ element and related equipment~~ according to a written checklist.

**C.2.1.6.** Staff shall document maintenance issues discovered during periodic monitoring and pre-use checks~~inspections~~ that pose a risk to participants or staff.

**C.2.1.7.** Staff shall document remediation of critical maintenance issues.

**C.2.1.8.** Staff shall be able to properly fit and use personal safety equipment in accordance with manufacturer and/or qualified person's recommended procedures.

**C.2.1.9.** Staff shall be able to set up, operate, and take down components ~~equipment~~ used for course operation.

**C.2.1.10.** Staff shall be able to evaluate proper ~~equipment~~ setup of course components.

**C.2.1.11.** *This item is intentionally left blank.*

**C.2.1.12.** Staff shall communicate to participants necessary safety information prior to the use of any activity or element.

**C.2.1.13.** Staff shall assess and confirm that activity corridors are clear of obstructions and hazards.

**C.2.1.14.** Staff shall teach and manage movements and/or transfers from one life safety system to another if applicable.

**C.2.1.15.** Staff shall identify and assess hazardous conditions that might require course operations to cease, and implement appropriate site-specific emergency procedures. At a minimum, this includes:~~, including but not limited to:~~

- Interruption of critical communications
- Severe weather
- Environmental hazards
- Catastrophic event

**C.2.1.16.** Staff shall perform appropriate interventions and/or technical rescues.

### C.2.2. Facilitated Challenge Course: Spotted Activities

**C.2.2.1.** Staff shall assess what level of ~~when~~ spotting is necessary for an activity. This determination shall be based on the element design, population, terrain and the original manufacturer or current vendor documented practices.

**C.2.2.2.** Staff shall provide for effective spotting on relevant activities.

**C.2.2.3.** Staff shall determine which spotting techniques are appropriate for relevant activities.

**C.2.2.4.** Staff shall assess when an individual or group is ready to implement the technique of spotting.

**C.2.2.5.** Staff shall teach relevant spotting techniques so participants have the ability to help manage risks.

**C.2.2.6.** Staff shall supervise and manage an individual or group's effective use of various spotting techniques.

**C.2.2.7.** Staff shall incorporate a clear and consistent communication system between spotter(s) and participant(s).

### C.2.3. Facilitated Challenge Course: Activities Using Life Safety Systems

**C.2.3.1.** Staff shall be able to assess when a life safety system is required for appropriate participant protection.

**C.2.3.2.** Staff shall select the appropriate operating system ~~personal safety system, belay system, or rope rigging system~~ from methods established by original equipment manufacturer and/or local operating procedures.

**C.2.3.3.** Staff shall be able to tie and evaluate appropriate knots for life safety applications ~~systems~~.

**C.2.3.4.** *This item is intentionally left blank.*

**C.2.3.5.** *This item is intentionally left blank.*

**C.2.3.6.** Staff shall effectively implement applicable top rope belay systems, to include at a minimum: ~~. Implementation includes and is not limited to:~~

- Proper physical positioning of a belayer in relation to a participant
- Controlling the belay rope and maintaining proper tension/slack at all times
- Incorporating backup, if necessary
- Incorporating a ground belay anchor system when needed
- Utilizing a communication system that is clear and consistent
- Having the participant attached to the belay system at all times
- Setting up an application-appropriate belay system including: an appropriate shear reduction device (if applicable), selection of a proper belay device, number and type of ropes, appropriate harness, and clip-in location
- Communicating element specific safety requirements to participants

**C.2.3.7.** Staff shall effectively supervise and monitor a participant belayer or group belay, taking reasonable steps to determine that the person or group is:

- Properly performing appropriate method and technique
- In proper physical position in relation to the participant
- In control of the belay rope and maintaining proper tension/slack at all times during the belay
- Incorporating backup, if necessary
- Incorporating a belayer anchor system when needed
- Utilizing a clear and consistent communication system

**C.2.3.8.** Staff shall assess the need for, and incorporate when necessary, spotting during belayed activities.

**C.2.3.9.** Staff shall effectively implement applicable personal safety system(s). At minimum, implementation includes: ~~Implementation includes and is not limited to:~~

- Proper method and technique
- Proper physical positioning of a participant
- Utilizing a communication system that is clear and consistent
- Having the participant protected from a fall from height at all times.

**C.2.3.10.** *This item is intentionally left blank.*

**C.2.3.11.** *This item is intentionally left blank.*

**C.2.3.12.** *This item is intentionally left blank.*

**C.2.3.13.** *This item is intentionally left blank.*

**C.2.3.14.** *This item is intentionally left blank.*

**C.2.3.15.** *This item is intentionally left blank.*

**C.2.3.16.** Staff shall use established methods to access high elements and elevated structures.

**C.2.3.17.** If applicable, s~~S~~taff shall use established procedures to retrieve life safety ~~perform applicable~~ equipment ~~retrievals~~ from lifelines.

**C.2.3.18.** *This item is intentionally left blank.*

**C.2.3.19.** Staff shall appropriately use ladders or other apparatus incorporated in any high element access or egress.

**C.2.3.20.** Staff shall use established methods to appropriately descend from a high element.

**C.2.3.21.** Staff shall properly set up, teach, and manage participant rappel stations if applicable. Skills include ~~and are not limited to~~:

- Identifying and using acceptable anchor points
- Setting up a proper system to allow timely lowering of a participant if the rappel device becomes jammed (e.g. releasable rappel line)
- Properly attaching rappel rope to anchors
- Properly setting up a separate belay or backup system
- Instructing participants in rappel method and technique including:
  - Proper brake hand position
  - Proper body position
  - Equipment use
- Properly manage any backup system incorporated
- Implementing proper communication techniques

**C.2.4. Guided Courses: Tensioned Rope Systems and Zip Lines ~~Zip Line Tours and Canopy Tours~~**

**C.2.4.1.** Staff shall understand and manage zip line participant take off, travel, and dismount. ~~as well as~~ Staff shall instruct and manage other relevant zip line procedures and techniques ~~which may~~ to include, when applicable: ~~and are not limited to:~~

- Body positioning
- Body orientation and control
- Speed control
- Signals and commands
- Braking
- Landing
- Retrieval protocol
- Hand placement
- Contingency response procedures

**C.2.4.1.1.** Staff responsible for the zip line procedures shall understand and use the organization's established methods of communication between take off and dismount locations. Operations shall cease any time all established communication methods are not functional.

**C.2.4.2.** Staff shall have a full understanding of and proficiency in the setup, operation and ongoing monitoring requirements of the braking system in effect, when operating zip line(s).

**C.2.4.3.** Staff shall use established methods to properly connect and disconnect a zip line pulley and other personal safety ~~system~~ equipment.

**C.2.4.4.** If applicable, staff shall have full understanding of and proficiency in the set-up, operation, and ongoing monitoring of equipment and procedures used for tandem or multi-person riding.

**C.2.4.5.** If applicable, staff shall have proficiency in belaying techniques ~~on vertical elements~~, proper use of belay equipment, and knowledge of communication protocol for belaying.

**C.2.5. Self-Guided Courses: Aerial Adventure/Trekking Parks**

**C.2.5.1.** Staff shall climb and work throughout the course area using staff Personal Safety Systems.

**C.2.5.2.** Staff shall monitor and/or supervise use of appropriate belay systems.

**C.2.5.3.** Staff shall monitor and assess participants as needed.

**C.2.5.4.** Staff shall respond to participants needing assistance.

**C.2.5.5.** Staff shall provide monitoring and/or supervision that are appropriate for the category of Personal Safety System(s) employed and participant requirements as defined by the original equipment manufacturer or qualified person.

**C.3. Interpersonal/Program Management Competencies**

**C.3.1. Communication**

**C.3.1.1.** Staff shall be able to clearly and concisely communicate in a manner appropriate to the participants and applicable to the course.

**C.3.1.2.** Staff shall provide opportunities for participant questions.

**C.3.2. Facilitated Courses: Program Design**

**C.3.2.1.** Staff shall conduct an appropriate needs assessment prior to program implementation.

**C.3.2.2.** Staff shall design and provide programming that addresses the needs of the client.

**C.3.2.3.** *This item is intentionally left blank.*

**C.3.3. Facilitated Courses: Assessment**

**C.3.3.1.** Staff shall conduct a group and individual participant assessment of physical abilities, readiness, affect, and behavior prior to activity engagement.

**C.3.3.2.** Staff shall conduct a performance ability self-assessment for tasks required to effectively facilitate and manage program risks prior to participant engagement.

**C.3.3.3.** Staff shall continually assess participants and staff throughout all aspects of their time on the course.

**C.3.3.4.** *This item is intentionally left blank.*

**C.3.4. Facilitated Courses: Program Implementation**

**C.3.4.1.** Staff shall communicate relevant program information to participants, including: the nature of the program as voluntary; an explanation of the course activities and/or elements; inherent risks; behavioral norms or expectations; and specific program objectives.

**C.3.4.2.** Staff shall assess group skills, abilities, goals, program objectives, developmental stages, and social/ cultural needs.

**C.3.4.3.** Staff shall sequence activities that they determine to be appropriate or suitable for the group based on an assessment of group skills, abilities, stages of development, goals, program objectives, and social/cultural needs.

**C.3.4.4.** *This item is intentionally left blank.*

**C.3.4.5.** Staff shall adapt challenge levels appropriate to group abilities, goals and program objectives.

**C.3.4.6.** Staff shall provide opportunities for discovery and reflection appropriate for the experience.

**C.3.4.7.** Staff shall facilitate experiences in a manner that does not unreasonably enlarge the risk for emotional, physical, or social harm.

**C.3.4.8.** Staff shall operate with an appropriate understanding/ knowledge of group-practitioner relationship roles.

**C.3.4.9.** Staff shall understand and recognize common group behaviors and be able to respond accordingly.

**C.3.4.10.** Staff shall manage conflicts or other difficulties arising with individuals or groups during the program.

**C.3.4.11.** Staff shall understand that group member interactions may reflect behaviors in extended work or social contexts.

**C.3.4.12.** Staff shall recognize that course activities may elicit powerful and intense reactions or emotions.

**C.3.4.13.** *This item is intentionally left blank.*

# CHAPTER 3

# TRAINING ~~STANDARDS~~

## A. GENERAL REQUIREMENTS

**A.1. Scope:** ~~The ANSI/ACCT 03-2019 Standards: Training Standards (hereinafter referred to as "Training Standard")~~The Training Chapter establishes the minimum requirements intended to enable course owner/operators to design and deliver, or acquire~~purchase~~ training curricula ~~that meet the minimum industry standards~~ and provide necessary content for staff.

**A.2. Purpose:** These training requirements~~standards~~ are intended for all trainings: from in-house job specific training to those trainings intended to develop a broader set of skills leading to practitioner certification.

**A.3. General Principles:** Successful training provides opportunities for practitioners to develop knowledge, skills, and understanding in order to deliver effective and consistent course experiences to participants.

## B. TRAINING

**B.1. Training Design**

**B.1.1.** Training and evaluation shall be designed by a qualified person.

**B.2.~~B.1.3.~~ Trainer Qualifications**

**B.2.1.~~B.1.3.~~** Training shall be delivered by a competent~~qualified~~ person.

**B.2.2.** Trainers shall consult qualified persons when issues or questions arise that fall outside the trainer's scope of expertise.

**B.2.3.** Trainers shall operate each course element according to the original equipment manufacturer and/or qualified person's recommended procedures, at minimum including: capacities, weights, number of participants, and use of life safety equipment.

**B.2.4.** At minimum, trainers shall refer to the documentation provided for the course per Chapter 1, A.4.1.2 and Chapter 2, B.2.4 and C.1.12.

**B.3. Training Content ~~Requisites~~**

**B.3.1. Technical Content:** ~~The t~~Training shall reinforce or increase staff competencies in the knowledge, skills, and understanding required to operate the course effectively.

**B.3.2. Facilitation Content:** Training shall reinforce or increase staff competencies with the knowledge, skills, and understanding required to operate an organization's course effectively.

**B.3.3. Emergency Procedures Content:** Training shall reinforce or increase staff competencies to respond to foreseeable emergencies.

**B.4.~~B.1.~~ Training Delivery ~~Requisites~~**

~~**B.1.1. Scope:** Training shall include the specific skills required to operate a course including and not limited to:~~

~~operations management, core, technical, and interpersonal/program management competencies.~~

B.4.1.~~B.1.2.~~ **Frequency:** Training shall occur annually, or more frequently, contingent upon staff turnover, seasonal fluctuations, operational changes, or as a response to incident/accident analysis.

B.4.2.~~B.1.4.~~ **Delivery:** Training shall provide staff with opportunity to obtain knowledge, skills, and understanding including hands-on, deliberate practice necessary to perform their duties.

B.4.2.1~~B.1.4.1.~~ **Trainee Safety:** The trainer shall manage risk to allow trainee error, while reducing the likelihood of serious injury or death.

B.4.3.~~B.1.5. Operational Standard:~~ Training shall be conducted in a manner consistent with Chapter 2: Operation~~ACCT Operation Standard Section B~~.

B.4.4.~~B.1.6.~~ **Disability:** Reasonable accommodations shall be made for persons with disabilities. Accommodations shall take into account the essential functions of each position.

B.4.5.~~B.1.7.~~ **Location:** Training shall take place at a course inspected and maintained to the current requirements of Chapter 1~~DPI Standard Section A through I~~.

B.5.~~B.2.~~ **Training Documentation ~~Requisites~~**

B.5.1.~~B.2.1.~~ **Training Records:** Training shall be documented. At minimum, this documentation shall ~~to~~ include ~~and not be limited to~~: trainees who were present, date, time, trainer, location, content, training objectives, and completion status.

B.5.2.~~B.2.2.~~ **Training Syllabi:** Training agenda shall be accurate to the training delivered and made available to each trainee.