



Fall Protection Program

Revised Nov 10/0011

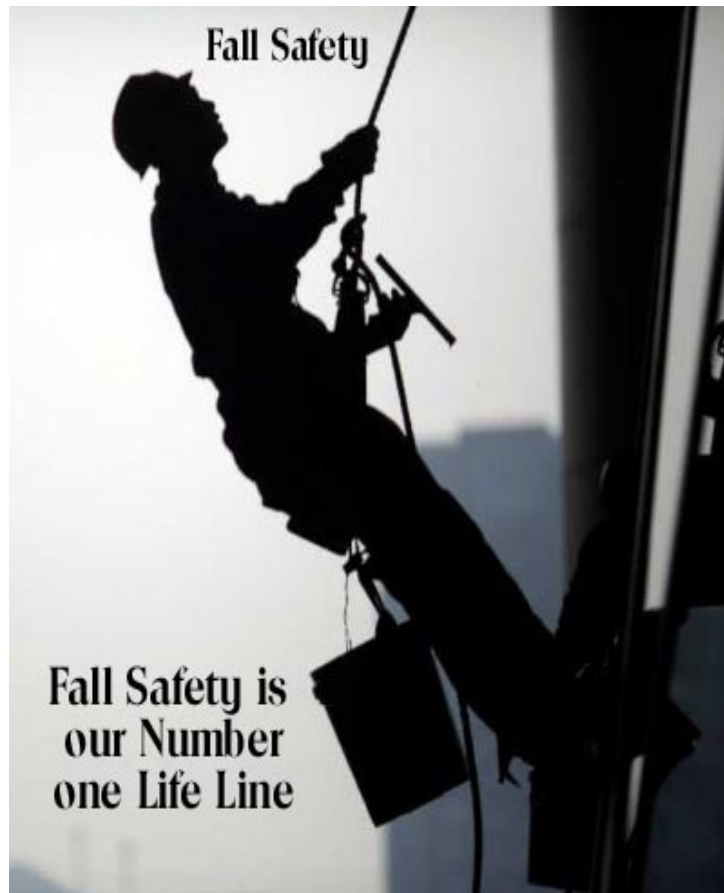


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Purpose and Scope

The purpose of this Fall Protection Program is to establish guidelines to protect all USGS employees engaged in outdoor or indoor work activities that expose them to potential falls from elevations. The scope of this Fall Protection Program includes all agency owned or leased buildings and projects funded by USGS and the USGS employees and others for whom the Government assumes workers compensation liability and whose duties may expose them to falls of 4 feet or more to a surface below in general industry situations; 6 feet or more in construction or construction-related activities; or to dangerous machinery from any height. This includes volunteers covered by a properly executed USGS Form 9-2080, Individual Volunteer Services Agreement, and students acquired by purchase orders citing Public Law 106-113 as the authority for the award, that work or come to these locations.

Note: Supervisors are to keep visitors (or volunteers not covered by a Form 9-2080) away from such circumstances, as is customary at construction or other hazardous sites where notices are posted and visitors are not allowed to proceed at all or without proper protection.

Goals

The goal of this Fall Protection Program is to prevent falls from heights. Falls from heights are the leading cause of death and debilitating injury in the construction industry, and our Bureau performs a number of tasks that expose employees to potential falls. This goal will be accomplished through effective education, engineering and administrative controls, use of fall protection systems, and enforcement of the program. This Fall Protection Program will be reviewed periodically and updated as necessary.

Definitions

Anchor Point. A secure point of attachment for lifelines, lanyards, or deceleration devices. An anchor point must be capable of supporting at least 5,000 pounds (3,600 pounds if engineered/certified by a qualified person) per person and must be independent of any anchor point being used to support or suspend platforms.

Authorized Person. An individual approved or assigned by the USGS to perform a specific type of duty or duties or to be at a specific location or job site (e.g., building maintenance, roof repair, etc.).

Carabiner. A metal loop (D ring) with a spring-hinged side that can quickly and reversibly connect components in safety-critical systems.

Clearance. The distance required to prevent the employee from striking the next level or any other obstruction below.

Competent Person. An individual who is capable of identifying existing or potential hazards in the surroundings or work areas and has the authority to take prompt corrective action to eliminate such hazards.

Connector. A device which is used to couple (connect) parts of the personal fall arrest system.

Deceleration Device. Any mechanism, such as a rope grab, rip-stitch lanyard, a specially woven lanyard, tearing or deforming lanyard, automatic self-retracting lifeline/ lanyard, etc., which serves to dissipate a substantial amount of energy during a fall arrest.

Deceleration Distance. The additional vertical distance a falling employee travels, excluding lifeline elongation and free-fall distance, before stopping and from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation of the deceleration device during a fall and the location of that attachment point after the employee comes to a full stop.

Free Fall. The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free-Fall Distance. The vertical displacement of the fall arrest attachment point on the employee's body harness between the onset of the fall and just before the system begins to apply force to arrest the fall. (The distance that a worker falls before engaging the fall arrest system.) Free-fall distance must not exceed 6 feet.

Full Body Harness. Webbing/straps which are secured about an employee's body in a manner that will distribute the fall arrest forces over the thighs, pelvis, waist, chest, and shoulders. Having means for attaching it to other components of a personal fall arrest system, preferably at the shoulders and/or middle of the back.

Guardrail System. A barrier erected to prevent employees from falling to lower levels. This system includes a toe board, midrail, and toprail able to withstand 200 pounds of force applied in any direction.

Lanyard. A flexible line of rope or strap that has self-locking snap hook connectors at each end for connecting to body harnesses, deceleration devices, and anchor points.

Leading Edge. The edge of a floor, roof, or other walking/working surface which changes location as an additional floor, roof, etc., is placed or constructed. A leading edge is considered an unprotected side or edge when not under active construction.

Lifeline. A flexible line for connecting to an anchor point at one end to hang vertically (vertical lifeline) or for connecting to anchor points at both ends to stretch horizontally (horizontal lifeline). Serves as a means for connecting other components of a personal fall arrest system to the anchor point.

Low Slope Roof. A roof having a slope of less than or equal to 4 in 12 (vertical to horizontal). A roof with approximately a 19.5 degree slope or less.

Personal Fall Arrest System. A system used to arrest (catch) an employee in a fall from a working level. It consists of an anchor point location, connectors, a body harness, and may include a lanyard, deceleration device, lifeline, or any combination thereof.

Qualified Person. An individual, who, by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training, and experience, has successfully

demonstrated his/her ability to solve or resolve problems relating to the subject matter, work, or project.

Rope Grab. A deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee.

Roof Work. The hoisting, storage, installation, repair, and removal of materials or equipment on the roof.

Safety Monitoring System. A safety system in which a competent person is responsible for recognizing and warning employees of potential fall hazards. All other fall protection systems must be deemed "infeasible" (through a study or review) before selecting or using a safety monitoring system.

Snap Hook. A connector comprised of a hook-shaped member with a closed keeper which may be opened to permit the hook to receive an object and when released, automatically closes to retain the object. Snap hooks must be self-closing with a self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection, thus preventing the opportunity for the object to "rollout" of the snap hook.

Steep Slope Roof. A roof having a slope greater than 4 in 12 (vertical to horizontal). A roof with a slope greater than 19.5 degrees.

Toe Board. A low protective barrier that will prevent the fall of materials and equipment to lower levels, usually 4 inches or greater in height.

Total Fall Distance. The maximum vertical change in distance from the bottom of an individual's feet at the onset of a fall, to the position of the feet after the fall is arrested. This includes the free-fall and deceleration distances.

Unprotected Sides and Edges. Any side or edge of a walking or working surface (e.g., floor, roof, ramp, runway, etc.) where there is no guardrail at least 39 inches high.

Warning Line System. A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge and designates an area in which work can be conducted without the use of guardrails, personal fall arrest systems, or safety nets to protect employees in the area. This will be utilized on any roof greater than 50 feet wide and in conjunction with a safety monitor and only where the other forms of fall protection have been deemed infeasible to use.

Types of Fall Protection Systems

Appropriate fall protection will be determined by the task to be performed. Examples include:

1. An articulating man lift provided with a restraint system and full body harness attached to an anchor point below the waist (preferably at the floor level).
2. Guardrail with a toe board, midrail, and toprail.
3. Personal fall arrest systems.
 - A. Anchor points (rated at 5,000 pounds per person).

B. Full body harness.

- (1) Restraint line or lanyard.
 - (2) Retractable lanyard.
 - (3) Rope grabs.
 - (4) Connectors (self-locking snap hooks).
4. Engineered lifelines.
 5. Warning lines.
 6. Safety nets.
 7. Safety monitoring systems.

Fall Protection Locations

Fall protection is required wherever the potential to fall 4 feet (6 feet for construction activities) or more exists. The *Great Western Painting Follows these suggestions &* has Identified the following places that require fall protection: (examples)

1. All flat and low sloped roof locations when working within 6 feet of the roof's edge or during roof repair/maintenance (4:12 pitch or less).
2. All exterior and interior equipment platforms, catwalks, and antennas/towers.
3. All exterior and interior fixed ladders above 20 feet.
4. All mezzanine and balcony edges.
5. All open excavations or pits.
6. All tasks requiring use of the articulating man lifts.
7. All tasks requiring employees to lean outside the vertical rails of ladders (e.g., painting, stairwell lightbulb replacement, etc.).
8. Scaffolding erection 10 feet or greater in height.
9. Cableways, bridge measurements.
10. Communications towers.

Fall protection is not needed if an employee or employees are on a low sloped roof for inspection/observation, provided that they do not approach within 8 feet of the roof's edge.

Fall Protection Guidelines - Options

Engineering Controls. Whenever possible, attempts should be made to change the nature of the task so that it is not necessary to use fall protection. Some examples would be: moving the task to ground level, using a telescoping arm to reach an area (e.g., to change a lightbulb), or use remote-sensing equipment rather than having to send a person into harm's way to make a measurement.

Guardrails. For all projects, only guardrails made from steel, wood, and wire rope will be acceptable. All guardrail systems will comply with the current OSHA standards. These guardrails will be placed in the following areas if necessary or feasible based on job location or requirements:

1. On all open-sided floors.
2. Around all open excavations or pits.
3. On leading edges of roofs or mezzanines.

Note: Ceiling or floor covers, of sufficient strength and construction, will be annotated with the word "hole" and placed over any ceiling or floor opening that poses a fall hazard.

Warning Line System

Warning lines may be appropriate for low sloped roofs where individuals do not need to go all the way to the edge to perform their tasks.

All construction work on a flat roof greater than 50 feet wide, which is performed 6 feet or further back from the roof's edge, can be completed by installing a warning line and using a safety monitor. If the roof is flat and less than 50 feet wide, a competent person safety monitor may be used.

Warning lines will:

1. Guard the entire perimeter of the roof where work is being performed.
2. Be erected 6 feet from the roof's edge.
3. Consist of wire or nylon rope.
4. Caution tape will be strung from post to post and must be able to withstand 16 pounds of force.
5. Be strung between stationary posts made of wood or metal.

If an employee must access an area within 6 feet of the roof's edge, for reasons other than exiting the roof via a ladder or fixed industrial ladder, another employee must monitor that individual

and warn him/her of any dangers. If another employee is not available to act as a safety monitor, then the employee must wear a full body harness, attached by a fall restraint lanyard to an anchor point, to prevent reaching the roof's edge.

Personal Fall Protection Systems

All employees, on any project that requires them to wear a personal fall arrest or restraint system, will follow these guidelines:

1. A full body harness will be used whenever there is the potential for a fall from a height of 6 feet or more.
2. Body belts may only be used to prevent a fall (for work positioning), not as part of a fall arrest system.
3. Only shock-absorbing lanyards or retractable lanyards are to be used to keep impact forces at a minimum on the body.
4. Only nylon rope or nylon straps with locking snap hooks are to be used for restraint.
5. All lanyards will have self-locking snap hooks.
6. The employee will inspect all personal fall arrest equipment before each use. Any equipment that has deteriorated or is bent, damaged, or otherwise impacted will be removed from service and disposed of so that it cannot be used again.

The maximum free-fall distance is not to exceed 6 feet. Consideration must be given to the total fall distance. The following factors can affect total fall distance:

1. Length of connecting means (e.g., lanyard length, use of shock absorbers, carabiners, snap hooks, etc.)
2. Position and height of anchor points relative to work platform/area (always keep above the head whenever possible).
3. Position of attachment and D ring slide on the full body harness.
4. Deployment of shock absorber (maximum 42 inches).
5. Movement in the lifeline.
6. Initial position of worker before free fall occurs (e.g., sitting, standing, etc.).

Fall Protection Calculations Learn These

Typically the maximum free-fall distances are as follows: 6 feet for a system with shock absorbers; 4 feet for a system without shock absorbers; and 2 feet for a work positioning system. A basic formula to calculate free fall is as follows:

(HD-LL)-DAE=Free-Fall Distance, where

HD is the height from the working surface (platform) to the D ring;

LL is the length of the lanyard; and

DAE is the distance from the anchor point to the edge of the platform.

Total Fall Distance

Total fall distance is the distance from the anchorage point to the D ring when extended once the fall is arrested.

Total Fall Distance =Free Fall Distance + Deceleration Distance

By OSHA standards, the maximum free-fall distance is 6 feet, and the maximum deceleration distance is 3-1/2 feet.

Clearance

A basic formula to calculate the clearance is as follows:

Length of Lanyard + Length of Deployed Shock Absorber + Height of the D Ring + Safety Factor (2-3 feet).

The vertical distance from the anchor point to the next lower level must exceed the clearance height or the worker will hit the surface.

Engineered Lifeline

1. Lifeline systems must be designed and approved by an engineer or qualified person.
2. Lifeline systems must be engineered to have appropriate anchor points; line strength designed to hold the number of individuals connected to it and to aid in the arrest of a fall; and durability in order to hold a fallen employee(s) suspended until a rescue can occur.

Inspection of Fall Protection Systems

All Employees will be required to No how to inspect equipment

The following criteria will be utilized to maintain all equipment in good working condition:

1. *Full Body Harnesses.*

A. Inspect before each use. Fall protection exhibiting any of these faults shall be removed from service and destroyed.

(1) Closely examine all of the nylon webbing to ensure that there are no burn marks which could weaken the material.

(2) Verify that there are **no torn, frayed, or broken fibers; pulled stitches; or frayed edges** anywhere on the harness.

(3) Examine the D ring for excessive wear, discoloration, pits, deterioration, or cracks.

(4) Verify that buckles are not deformed or cracked and operate correctly.

(5) Check to see that each grommet (if present) is secure and not deformed from abuse or a fall.

(6) **The harness should never have additional punched holes.**

(7) All rivets should be tight and not deformed.

(8) Check tongue/straps for excessive wear from repeated buckling.

B. A competent person will complete an annual inspection of all harnesses and documentation will be maintained (see *Appendix I*). Harnesses will be hung and stored in an enclosed cabinet to protect from damage.

C. **All harnesses that are involved in a fall will be destroyed.**

2. *Lanyards/Shock-Absorbing Lanyards.*

A. Inspect before each use.

(1) Check lanyard material for cuts, burns, abrasions, kinks, knots, broken stitches, and excessive wear.

(2) Inspect the snap hooks for distortions in the hook, locks, and eye.

(3) Check carabiner for excessive wear, distortion, and lock operation.

(4) Ensure that all locking mechanisms seat and lock properly.

(5) Once locked, locking mechanism should prevent hook from opening.

(6) Visually inspect shock absorber (if present) for any signs of damage, paying close attention to where the shock absorber attaches to the lanyard.

(7) Verify that points where the lanyard attaches to the snap hooks are free of defects.

B. A competent person will complete an annual inspection of all lanyards and documentation will be maintained (see *Appendix 2*). Lanyards will be hung and stored in an enclosed cabinet to protect from damage.

C. All lanyards that are involved in a fall will be destroyed.

Self-Retracting Lanyards/Lifelines

1. Inspect before each use.

A. Visually inspect the body to ensure that there is no physical damage to the body.

B. Make sure that all nuts and rivets are tight.

C. Make sure that the entire length of the nylon strap/wire rope is free from cuts, burns, abrasions, kinks, knots, broken stitches/strands, excessive wear, and retracts freely.

D. Test the unit by pulling sharply on the lanyard/ lifeline to verify that the locking mechanism is operating correctly.

E. If the manufacturer requires, make certain that the retractable lanyard is returned to the manufacturer for scheduled annual inspections.

2. A competent person will conduct a monthly inspection of all self-retracting lanyards/lifelines and documentation will be maintained (see *Appendix 4*).

3. Service per manufacturer specifications (1-2 years).

4. Inspect for proper function after every fall.

Snap Hooks and Carabiners

1. Inspect before each use.

A. Verify that there are no hook and eye distortions.

B. Verify that there are no cracks or pitted surfaces.

C. The keeper latch should not be bent, distorted, or obstructed.

D. Verify that the keeper latch seats into the nose without binding.

- E. Verify that the keeper spring securely closes the keeper latch.
2. Test the locking mechanism to verify that the keeper latch locks properly.
3. A competent person will complete an annual inspection of all snap hooks and documentation will be maintained (see *Appendix 3*).
4. All snap hooks involved in a fall will be destroyed.

Tie-Off Adapters/Anchor Points

1. Inspect for integrity and attachment to solid surface.
2. A competent person will complete an annual inspection of all tie offs and anchor points and documentation will be maintained.
3. All tie offs and anchor points will be destroyed after a fall.

Articulating Man Lift

1. Inspect before each use.
2. Inspect/service per manufacturer guidelines. Forklift, scissors lifts, and safety nets will be inspected at the beginning of each shift in use. Structural integrity of the forklift basket will be checked per the same schedule.
3. A competent person will complete an annual inspection of the forklift basket and documentation will be maintained. **Mandatory**

Horizontal Lifelines

1. Inspect for structural integrity of line and anchors before each use.
2. A competent person will complete an annual inspection.

Guardrails

1. *Temporary systems.* A daily visual inspection will be completed by a competent person.
2. *Temporary systems.* A complete structural inspection will be completed weekly by a competent person.
3. *Permanent systems.* Annual structural inspections will be completed by a competent person with future frequency of inspection based on conditions/controls present.

Storage and Maintenance of Fall Protection Equipment

- A. Never store the personal fall arrest equipment in the bottom of a toolbox, on the ground, or outdoors exposed to the elements (e.g., sun, rain, snow, etc.).
- B. Hang equipment in a cool, dry location in a manner that retains its shape.
- C. Always follow manufacturer recommendations for inspections.
- D. Clean with a mild, nonabrasive soap and hang to dry.
- E. Never force dry or use strong detergents in cleaning.
- F. Never store equipment near excessive heat, chemicals, moisture, or sunlight.
- G. Never store in an area with exposures to fumes or corrosive elements.
- H. Avoid dirt or other types of buildup on equipment.
- I. Never use this equipment for any purpose other than personal fall arrest.
- J. Once exposed to a fall, remove equipment from service immediately.

Fall Protection Training

1. Document the attendance of all trainees (see *Appendix 5*).

2. All employees engaged in fall protection will be trained and have the knowledge to:

- A. Recognize the fall hazards associated with their job sites.
- B. Understand the hazards associated with working near fall hazards.
- C. Work safely in hazardous areas by utilizing appropriate fall protection measures.
- D. Understand and follow all components of this fall protection program.
- E. Identify and understand the enforceable Department of Commerce/Occupational Safety and Health Administration (OSHA) standards and American National Standards Institute (ANSI) standards that pertain to fall protection.

Rescue Procedures/Methods

In the unlikely event that a fall arrest occurs on site, personnel, using an articulating man lift or ladders where feasible, will rescue all employees. Alternate rescue would be through local emergency services.

Communication Issues

In the event of a fall, the following people will be notified as soon as possible.

1. **Rescue personnel (e.g., maintenance personnel)**

. Patrick 801-347-6644 Robert 208-371-7757

2. Manager or supervisor.
3. Safety officer/coordinator.
4. Fire department and emergency medical services, if necessary.

At the beginning of any work activity where fall protection is an issue, rescue plans must be identified and discussed with all employees. The *(insert the title{s} or name{s} of person)* will develop the rescue plan(s).

All employees involved in a fall arrest or fall will immediately be sent for a medical evaluation to determine the extent of injuries, if any.

Fall Investigation

1. All fall investigations will be conducted by *(insert the title{s} or name{s} of person)*.
2. The following documentation will be completed as part of the fall investigation:
 - A. Interviews with staff and witnesses.
 - B. Employee injury/accident report.
 - C. Supervisor injury/accident report.

Fall Protection Program Evaluation

This fall protection program will be evaluated periodically to determine its effectiveness. The following criteria will be used to evaluate its performance:

1. Accident reports.
2. Number of accidents.
3. Management/staff compliance with program components.
4. Periodic on-site audits.
5. Staff feedback and interviews.

Contractors Guidelines

All outside contractors working in or on the premises of *(insert name/location)* will be required to follow the guidelines set forth in this fall protection program. Contractors in the post-award meeting will be informed of these requirements as well as the on-site construction rules that apply.



Appendix 1

Full Body Harness
Annual Inspection Checklist

Harness Model/Name: _____

Serial Number: _____ Lot Number: _____

Date of Manufacture: _____ Date of Purchase: _____

What to look for:	Accepted/Rejected	Comments
Hardware: Includes D rings, buckles, keepers, and back pads. Inspect for damage, distortion, sharp edges, burrs, cracks and corrosion	Accepted Rejected	
Webbing: Inspect for cuts, burns, tears, abrasions, frays, excessive soiling, and discoloration.	Accepted Rejected	
Stitching: Inspect for pulled or cut stitches	Accepted Rejected	
Labels: Inspect, making certain all labels are securely held in place and are legible.	Accepted Rejected	
Other:	Accepted Rejected	
Others:	Accepted Rejected	
Overall disposition:	Accepted Rejected	Inspected By: Date Inspected:

Appendix 2

Lanyards
Annual Inspection Checklist

Lanyard Model/Name: _____

Serial Number: _____ Lot Number: _____

Date of Manufacture: _____ Date of Purchase: _____

What to look for:	Accepted/Rejected	Comments
Hardware: Includes snap hooks, carabiners, adjusters, keepers, thimbles, and D rings. Inspect for damage, distortion, sharp edges, burrs, cracks, corrosion and proper operation.	Accepted Rejected	
Webbing: Inspect for cuts, burns, tears, abrasions, frays, excessive soiling, and discoloration.	Accepted Rejected	
Stitching: Inspect for pulled or cut stitches.	Accepted Rejected	
Synthetic Rope: Inspect for pulled or cut yarns, burns, abrasions, knots, excessive soiling, and discoloration.	Accepted Rejected	
Energy Absorbing Component: Inspect for elongation, tears and excessive soiling.	Accepted Rejected	
Labels: Inspect, making certain all labels are securely held in place and are legible.	Accepted Rejected	
Overall disposition:	Accepted	Inspected By: Date Inspected:

	Rejected	
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Appendix 3

Snap Hooks and Carabiners
Annual Inspection Checklist

Hook/Carabiner Model/Name: _____

Serial Number: _____ Lot Number: _____

Date of Manufacture: _____ Date of Purchase: _____

What to look for:	Accepted/Rejected	Comments
Physical Damage: Inspect for cracks, sharp edges, burrs, deformities and locking operations	Accepted Rejected	
Excessive Corrosion: Inspect for corrosion, which affects the operation and/or the strength.	Accepted Rejected	
Markings: Inspect and make certain marking(s) are legible.	Accepted Rejected	
Other:	Accepted Rejected	
Other:	Accepted Rejected	
Other:	Accepted Rejected	
Overall disposition:	Accepted Rejected	Inspected By: Date Inspected:

Appendix 4

Self-Retracting Lanyard/Lifeline
Annual Inspection Checklist

Self-retracting Lanyard/Lifeline Model/Name: _____

Serial Number: _____ Lot Number: _____

Date of Manufacture: _____ Date of Purchase: _____

Inspection Items	Accepted/Rejected	Comments
Impact Indicator: Inspect indicator for activation (rupture of red stitch, elongated indicator, etc.).	Accepted	
	Rejected	
Screws/Fasteners: Inspect for damage and make sure all screws and fasteners are tight.	Accepted	
	Rejected	
Housing: Inspect for distortion, cracks and other damage. Inspect anchoring loop for distortion or damage.	Accepted	
	Rejected	
Lanyard/Lifeline: Inspect for cuts, burns, tears, abrasion, frays, excessive soiling and discoloration.	Accepted	
	Rejected	
Locking Action: Inspect for proper breaking action.	Accepted	
	Rejected	
Retraction/Extension: Inspect spring tension by pulling lanyard out fully and allowing to retract fully (lifeline must be taut with no slack).	Accepted	
	Rejected	
Hooks/Carabiners: Inspect for physical damage, corrosion, proper orientation and markings.	Accepted	
	Rejected	
Labels: Inspect, making certain all labels are securely	Accepted	

held in place and legible.	Rejected	
Overall disposition:	Accepted	Inspected by:
	Rejected	Date Inspected

