## 1 Purpose

Falls from heights and on level surfaces (a working surface) are among the leading causes of serious work-related injuries and deaths. OSHA estimates that, on average, approximately 202,066 serious (lost-workday) injuries and 345 fatalities occur annually among workers who experience these types of falls. According to the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI), from 1999 to 2010, falls were second only to highway incidents in terms of fatal injuries. Silver Eagle Distributors Houston, LLC (Silver Eagle Houston) has established this standard to reduce the risk of these types of injuries.

## 2 Definitions

**Anchorage** - a secure point of attachment for equipment such as lifelines, lanyards, or deceleration devices.

**Body harness** - straps that secure about the employee in a manner to distribute the forces caused by the fall arrest over at least the thighs, pelvis, waist, chest, and shoulders, with a means for attaching the harness to other components of a personal fall protection system.

**Competent Person** - a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it and who has authorization to take prompt, corrective action to eliminate the identified hazards.

**Connector** - a device used to couple (connect) parts of the fall protection system together.

**Deceleration device** - any mechanism, such as automatic self-retracting lifelines/lanyards, that serves to dissipate energy during a fall.

**Deceleration distance** - the vertical distance a falling employee travels from the point at which the deceleration device begins to operate, excluding lifeline elongation and free fall distance, until stopping.

**Designated area** - a space which has a perimeter barrier erected to warn employees when they approach an unprotected side or edge, and serves also to designate an area where work may be performed without additional fall protection.

**Fall protection** - any equipment, device, or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall. Fall protection must be used whenever an employee has the potential to fall 4 feet or more to a lower level and there are no means to prevent a fall.

**Free fall distance** - the vertical fall distance before the fall arrest system takes effect.

**Guardrail system** - a barrier erected to prevent employees from falling to a lower level.

**Hole** - a gap or void in a floor, roof, or other walking-working surface.

**Lanyard** - a flexible line used to secure a body harness to a deceleration device, lifeline, or anchorage.

**Lifeline** - a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Low-slope roof** - a roof that has a slope less than or equal to 10 degrees.

**Lower level** - a surface or area to which an employee can fall. Such surfaces or areas include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, or tanks.

**Opening** - a gap or open space through which an employee can fall to a lower level.

**Personal Fall Arrest System (PFAS)** - a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

**Qualified Person** - a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

**Self-retracting lifeline/lanyard** - a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

**Snaphook** - a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types: (1) The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or (2) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. The use of a non-locking snaphook as part of personal fall arrest systems is prohibited.

**Toeboard** - a low protective barrier that is designed to prevent materials, tools, and equipment from falling to a lower level, and protect employees from falling.

**Travel restraint system** - a protective system that prevents employees from reaching an edge where a fall is possible. The restraint is generally a line from an anchorage to which the employee is secured in such a way as to prevent the employee from walking or falling off an elevated work surface. A “traveling restraint system” would refer to a line between two anchorages that would enable the employee to attach to that line yet limit travel in such a manner as to prevent exposure to a fall hazard. Travel restraint systems must be used such that they do not support any portion of the employee's weight and freely travel between the anchorages while preventing the possibility of a fall.

**Unprotected sides and edges** - any side or edge of a walking-working surface where there is no wall or guardrail system at least 39 inches high to protect an employee from falling to a lower level.

**Walking-working surface** - any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.

## 3 Roles and Responsibilities

3.1 Employees will:

- Comply with the requirements outlined in this standard.
- Pre-plan jobs requiring working at heights with their supervisor to ensure they can be done safely.
- Understand the hazards of working at heights and the limitations of fall protection equipment.
- Complete training prior to using fall protection equipment.

- Ensure that fall protection equipment is inspected prior to use and report defective equipment immediately to their supervisor.
- Report conditions that may lead to falls to their supervisor.

3.2 Competent Person will:

- Comply with the requirements outlined in this standard.
- Inspect and document fall protection equipment at least annually.
- Ensure persons using fall protection equipment have received proper and adequate training.

3.3 Supervisors will:

- Comply with the requirements outlined in this standard.
- Ensure employees who conduct work from elevated surfaces are trained in fall protection practices.
- Assess work practices and workplaces to determine how fall hazards can be eliminated, prevented, and controlled.
- Pre-plan the job with employees to ensure they are aware of job hazards, limitations of fall protection equipment, and rescue procedures.
- Ensure that fall protection equipment is available and in safe working condition.
- Plan for emergency rescue in the event of a fall.

3.4 Facilities Management will:

- Comply with the requirements outlined in this standard.
- Ensure that walking-working surfaces are inspected, regularly and as necessary, and maintained in a safe condition.
- Ensure, through training, there is at least one Competent Person who is authorized to take corrective measures to eliminate hazards.
- Maintain documentation of fall protection equipment inspections.

3.5 HSE Department will:

- Ensure implementation and compliance with this standard by all employees.
- Review this standard periodically to identify gaps.
- Assist in the assessment of work practices and workplaces to determine how fall hazards can be eliminated, prevented, and controlled.

## 4 Fall Protection Requirements

4.1 General Considerations

4.1.1 The intent of the Silver Eagle Houston Walking, Working Surfaces and Fall Protection Standard is to eliminate or minimize the risk of fall hazards to protect employees while still allowing the employee to conduct their work. There are strategies that can be used to eliminate or minimize risks. They are, in order of preference:

- Elimination- A thorough assessment of work practices and the workplace should be performed to determine how fall hazards can be eliminated. This is the preferred method for protection against fall hazards. An example of eliminating a fall hazard is to complete the work at ground level.
- Prevention- Requires an assessment of work practices and the workplace. Prevention seeks to prevent the fall before it actually happens. An example of prevention is the use of guardrails.
- Control- If fall hazards cannot be eliminated or prevented, they must be controlled with fall protection devices. These devices aim to reduce the risk of injury after a fall.

4.1.2 Selecting proper fall protection requires an assessment of work practices and the workplace to ensure that the proper equipment is selected. It also requires training in the selection, use, and inspection of equipment.

4.2 Ladder Safety

4.2.1 Ladder Hazards

There are inherent hazards associated with ladder use. Typical ladder hazards include:

- Insufficient surface resistance on ladder rungs and steps
- Ladder structural failure
- Ladders tipping sideways, backwards, or slipping out at the bottom
- Ladder spreaders not fully opened and locked, causing the ladder to “walk”, twist or close up when a load is applied to the ladder
- Using metal ladders around electricity
- Using deteriorated ladders
- Using fixed ladders without cages or fall protection

4.2.2 Safe Ladder Use

Employees should follow certain rules when placing, ascending, and descending ladders which include:

- Hold on with both hands when going up or down. If material must be handled, raise or lower it with a rope either before going down or after climbing to the desired level.
- Always face the ladder when ascending or descending.
- Never slide down a ladder.
- Be sure shoes are not greasy, muddy, or slippery before climbing.
- Do not climb higher than the third rung from the top on straight or extension ladder, or the second tread from the top on stepladders.
- Carry tools on a tool belt not in the hand.
- Never lean too far to the sides. Keep your belt buckle within the side rails.

- Use a 4 to 1 ratio when leaning a single or extension ladder. (place a 12 foot ladder so that the bottom is 3 feet away from the object the ladder is leaning against.)
- Inspect ladder for defects before using.
- Never use a defective ladder. Tag or mark it so that it will be repaired or destroyed.
- Never splice or lash a short ladder together.
- Never use makeshift ladders, such as cleats fastened across a single rail.
- Be sure that a stepladder is fully open and the metal spreader locked before starting to climb.
- Keep ladders clean and free from dirt and grease.
- Never use ladders during a strong wind except in an emergency and then only when they are securely fastened.
- Never leave placed ladders unattended.
- Never use ladders as guys, braces, or skids, or for any other purpose other than their intended purposes.
- Never attempt to adjust a ladder while a user is standing on the ladder.
- Never jump from a ladder. Always dismount from the bottom rung.

4.3 Guardrail Systems

4.3.1 Every open-sided floor or platform 4 feet or more above a lower level shall be guarded by a standard railing on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.

4.3.2 A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a minimum vertical height of 42 inches, plus or minus 3 inches, from the upper surface of the top rail to floor, platform, runway, or ramp level.

4.3.3 For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 6 feet between posts; the top and intermediate rails shall be of at least 2-inch by 4-inch stock. If the top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts may be spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.

4.3.4 For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal diameter with posts spaced not more than 8 feet on centers.

4.3.5 For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.

4.3.6 Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members must be installed between the top edge of the guardrail system and the walking-working surface when there are no walls at least 21 inches high.

4.3.7 If intermediate vertical members (such as balusters) are used, they will be installed no more than 19 inches apart; and other equivalent intermediate members (such as additional mid-rails

and architectural panels) will be installed so that the openings are not more than 19 inches wide.

4.3.8 The guardrail system must be capable of withstanding a force of at least 200 pounds applied within 2 inches of the top edge in any outward or downward direction.

4.3.9 The top rail shall be smooth-surfaced throughout the length of the railing. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

4.3.10 The railing shall be provided with a toe-board wherever, beneath the open sides, persons can pass, there is moving machinery below, or there is equipment with which falling materials could create a hazard.

4.3.11 A standard toe-board shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and with not more than ¼ inch clearance above floor level. It may be made of any substantial material either solid or with openings not over 1 inch in greatest dimension. It shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe-board.

4.3.12 Guardrail systems may be temporary and erected for specific tasks. They must meet the same height and performance requirements as permanent guardrails.

4.3.13 Guardrail height must be adjusted to accommodate the height of stilts, if they are in use.

4.3.14 Stairways with at least three treads and four risers shall be constructed in accordance with the specifications outlined in 29 CFR 1910.25 and have handrails as described in 29 CFR 1910.28 – Table D-2.

4.4 Covers

Covers used to cover holes, including skylights, in a walking-working surface must:

- Be capable of supporting without failure, at least twice the maximum intended load that may be imposed on the cover at any one time, including employees, equipment, and materials.
- Be secured to prevent accidental displacement.
- Be labeled as “hole” or “cover”.

4.5 Personal Fall Arrest Systems (PFAS)

4.5.1 Where employees must work at an elevated working surface, exposed to fall hazards, where a free fall is possible and either a guardrail, or a travel restraint system is not feasible:

- A full-body harness, approved connecting lanyard and suitable anchor point must be used.
- All PFAS components shall be compatible with each other.
- All PFAS equipment shall meet applicable ANSI standards and OSHA regulations.
- All PFAS equipment shall be used as per the manufacturer.

- The PFAS shall not allow a falling employee to free fall more than 6 feet or strike a lower level and limit the maximum deceleration distance to 3.5 feet.
- The maximum arresting force on the employee may only be up to 1,800 pounds.
- All snap hooks shall be double-locking, thereby not allowing pressure to be applied to the gate in the opening direction.
- Snap hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook. Only a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member shall be used.
- Horizontal lifelines shall be designed, installed, and used, under the supervision of a Qualified Person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. Where vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Lifelines shall be protected against being cut or abraded.
- Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two.
- The anchor point should be overhead and as close as possible to reduce fall arresting forces in the event a fall should occur.
- Avoid anchor points where a fall may result in a pendulum motion that could cause serious injury (aka swing-fall).
- Systems used by an employee having a combined person and tool weight in excess of 310 pounds shall be modified to provide proper protection for such heavier loads.
- The attachment point of the connecting lanyard to the full-body harness shall be located in the center of the wearer’s back near shoulder level.
- Fall protection equipment shall be utilized for employee protection only, and should not be used for any other use. For example, fall protection equipment should never be used as hoisting slings, tow ropes, etc.
- PFAS and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection.
- PFAS shall properly fit each employee to ensure that the system is capable of keeping the employee within the system or strap configuration without making contact with the neck or chin area.

- PFAS shall not be attached to guardrail systems.

4.5.2 PFAS Storage and Inspections

4.5.2.1 Storage

A dedicated storage area shall be provided for the storage of fall protection equipment and all components. The storage area shall keep the equipment clean, dry, and free from oils, chemicals, paints, and excessive heat.

4.5.2.2 Inspections

Fall protection equipment shall be inspected before each use for wear, damage, other deterioration, or other defects as per the manufacturer. The manufacturer's instructions for inspecting equipment shall be followed. The PFAS Inspection sheet may be used in combination with manufacturer's instructions.

Additionally, all fall protection equipment subjected to impact loading shall be promptly removed from service.

4.6 Rescue/Retrieval

4.6.1 The Supervisor or Competent Person shall plan for the prompt rescue of employees in the event of a fall or ensure that employees are able to rescue themselves.

4.6.2 Prior to the beginning of each elevated work assignment, the Supervisor or Competent Person shall evaluate and plan for the prompt rescue of employees involved in a fall.

## 5 Training

5.1 Before any employee is exposed to a fall hazard, training shall be provided by a qualified person. Training shall include:

- The nature of the fall hazards in the work area and how to recognize and minimize them.
- The procedures for installing, inspecting, operating, maintaining, disassembling, and storing the personal fall protection systems.
- Applicable OSHA regulations and ANSI standards.

5.2 Training records will be maintained by the HSE Department. The records shall contain:

- The name of the employees trained.
- The dates of training.
- The name and signature of the person who conducted the training.

5.3 Retraining shall be conducted when:

- Changes in the workplace render previous training obsolete or inadequate.
- Changes in the types of fall protection systems or equipment to be used render previous training obsolete or inadequate.
- Inadequacies in an employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to perform the job safely.

## 6 References

OSHA 29 CFR 1910 Subpart D

OSHA 29 CFR 1910.140

## 7 Document Revision Register

| Revision # | Section # | Date | Revision Description |
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| 0 | | 01/01/2020 | Initial Issue |
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