

 <b>CITY OF TUCSON</b>	<b>City of Tucson</b> Central Safety Services Number: S-004 Subject:	Page 1 of 23
		Effective Date: January 1, 1997
	<b>Fall Protection</b>	Reviewed/ Revised: January 1, 2013

### 1.0 PURPOSE

To outline procedures to ensure that City of Tucson employees are provided with proper methods to eliminate or minimize injuries resulting from falls.

### 2.0 SCOPE

This program will assist in defining workplaces, operations, conditions, and circumstances for which fall protection shall be provided per OSHA Standards.

The policies and procedures contained in this section are intended to assist in identifying and complying with OSHA Safety Standards. In all cases where there is a difference between specific OSHA standards and the Fall Protection policies set forth in this chapter, the stricter of the two shall apply.

### 3.0 DEFINITIONS:

**Anchorage:** Means a secure point of attachment for lifelines, lanyards or deceleration devices.

**Buckle:** Means any device for holding the body belt (Positioning Device) or body harness closed around the employee's body.

**Competent Person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees; also one who has the authorization to take prompt corrective measures to eliminate them.

**Connector:** Means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a self-locking, self-closing rated carabineer, or it may be an integral part of the system (such as a buckle or D-ring sewn into a Positioning Device or Body Harness or a snap hook spliced or sewn into a lanyard or self-retracting device.

**Controlled Access Zone (CAZ):** Means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

**Dangerous equipment:** Means equipment such as open tanks, degreasing units, machinery, electrical equipment, water wells, reservoirs, and other units which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 2 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

**Deceleration Device:** Means any mechanism, such as a rope grab, rip stitch lanyard, specially woven lanyard, tearing or deforming lanyard, automatic self-retracting lanyard or lifeline, which serves to dissipate a substantial amount of energy during a fall, or otherwise limit the energy imposed on an employee during a fall.

**Deceleration Distance:** Means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, 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 belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

**Engineering Controls:** These controls include physical changes, such as a permanent working platform with guardrails, for a specific work function.

**Fall Protection:** Any device, permanent structure, or personal fall arrest system that is designed to prevent an employee from falling.

**Full Body Harness:** Means a manufactured device secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with a means for attaching it to other components of a personal fall arrest system.

**Guard Rail System:** Means a barrier erected to prevent employees from falling to lower levels.

**Hole:** Means a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.

**Lanyard:** Means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

**Leading edge:** Means the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

**Lifeline:** Means 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

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 3 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Low-slope Roof:** Means a roof having a slope less than or equal to 4' in 12' (vertical to horizontal).

**Mechanical Equipment:** All motor or human propelled, wheeled equipment, except for wheelbarrows and mop carts.

**Opening:** Means a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

**Personal Fall Arrest System:** Means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. **As of January 1, 1998, the use of a body belt for fall arrest is prohibited.**

**Positioning Device System:** Means a body belt or harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall or ladder, and climb or work with both hands free while leaning, or when working on a horizontal surface, rigged as to restrict the employee from approaching the leading edge. In either case, the Positioning Device shall be rigged to prevent an employee fall that is greater than two feet (2').

**Platform:** A working space for persons elevated above the surrounding floor or ground, such as a balcony or platform, for the operation of machinery and equipment.

**Roof:** The exterior surface on the top of a building. This does not include floors which, because a building has not been completely built, temporarily become the top surface of a building.

**Rope Grab:** Means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

**Runway:** A passageway for persons elevated above the surrounding floor or ground level, such as a foot walk along shafting or a walkway between buildings.

**Safety-monitoring System:** means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 4 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

**Self-retracting Lifeline/Lanyard:** means 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.

**Skylight:** Fitted within or on top of a roof, normally constructed of framed members covered with a clear or white opaque plastic dome.

**Snap hook:** Means 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. Snap hooks are generally one of two types:

- 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
- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. **As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.**

**Solar Tube:** A light emitting device normally twelve inches (12") in diameter or less installed within a roof, covered by a clear or opaque plastic dome.

**Standard Railing:** A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

**Standard Strength and Construction:** Any construction of railings, covers, or other guards which meets the requirements of OSHA 29 CFR 1926-502, Sub Part M.

**Toeboard:** A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

**Unprotected Side or Edge:** Any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches high.

**Walking/working Surface:** means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel, vehicles and trailers where the work performed is greater than four feet (4') from the floor level, excepting ladders.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 5 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

**Warning Line System:** Means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

#### **4.0 RESPONSIBILITIES**

##### **A. Department**

1. Directors shall be responsible for implementing the Fall Protection Program and distributing this procedure. The Department Director shall ensure that plan checks on all new departmental construction projects be made prior to the mailing of Requests For Proposals (RFPs) to reduce or control the potential for any fall hazards.

##### **B. Administrators**

1. Administrators shall be responsible for the enforcement of this program as well as for any disciplinary action taken against any City employee failing to use proper fall protection. The Division Administrator shall assign an individual responsible enforcing the Fall Protection Program (Fall Protection Coordinator). This individual must be afforded adequate time, resources, and authority to implement and maintain this program.

##### **C. Supervisors**

1. Supervisors shall enforce the Fall Protection Program in the field.
2. The Fall Protection Coordinator shall:
  - a. Review Job Hazard Analysis for all job classifications in the department or division requiring Fall Protection.
  - b. Ensure employees are trained in the requirements of Fall Protection, Fall Protection systems, equipment, and periodic inspection of Fall Protection equipment.
  - c. Determine if any engineering controls or work practices can be implemented before personal fall protection is required.
  - d. Designate work functions which require fall protection and the type of fall protection required.
  - e. Plan a method of rescue for each work practice requiring the use of a Personal Fall Arrest System.
  - f. Periodically review work functions for any changes or additional fall protection is required.
  - g. Ensure that fall protection equipment is stored, inspected and maintained in good condition and that the service life, as per manufacturer's specifications is followed.
  - h. Create and maintain an Inspection Log so that employee may note equipment inspection and any deficiencies.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 6 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

3. Pre-use inspection and maintenance techniques for Personal Fall Arrest Systems and Positioning Devices are referenced in Appendix B.

**D. Employees**

1. Employees shall:
  - a. Use fall protection equipment when required.
  - b. Inspect and log inspection results for all Personal Fall Arrest Systems and Positioning Devices prior to each use.
  - c. Maintain fall protection equipment in a clean and usable condition.
  - d. Report any defects in fall protection equipment and any suggested improvements to the Fall Protection Program to supervisor or Fall Protection Coordinator.
  - e. Immediately report all slips and falls to supervision.
  - f. Equipment that has subjected to a fall shall be immediately removed from service and discarded.

**E. Central Safety Services**

1. Central Safety Services shall:
  - a. Inspect and certify all Personal Fall Arrest Systems and associated fall prevention equipment, annually for each department.

**5.0 EDUCATION AND TRAINING**

**A. Central Safety Services**

1. Central Safety Services shall:
  - a. Assist Fall Protection Coordinator in designating work functions which require fall protection and type of fall protection needed.
  - b. Provide periodic work site inspections to assure program compliance.
2. Central Safety Services shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

**B. Department**

1. The Department shall assure that each employee has been trained, as necessary, by a Competent Person qualified in the following areas:
  - a. The nature of fall hazards in the work area;
  - b. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 7 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

- c. The use and operation of guardrail systems, personal fall arrest systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
- d. The role of each employee in the safety monitoring system when this system is used;
- e. The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
- f. The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and
- g. The role of employees in fall protection plans;

**C. Certification of Training**

1. The Department, in conjunction with Central Safety Services shall verify compliance with Section 6.0 by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.

**D. Retraining**

1. When the department has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (a) of this section, the department shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:
  - a. Changes in the workplace render previous training obsolete; or
  - b. Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or
  - c. Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

**6.0 GENERAL**

**A. Duty to Have Fall Protection**

1. Each employee who is performing construction-like work and is 6 feet (6') or more above lower levels shall be protected from falling by guardrail systems, or personal fall arrest systems.
2. Each employee performing a maintenance function on equipment or surfaces 4 feet (4') or more above a lower level shall be protected from falling by a guardrail system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 8 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

#### **B. Hoist Areas**

1. Each employee in a hoist area shall be protected from falling 4 feet (4') or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, [or chain, gate, or guardrail] or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system.
2. When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

#### **C. Holes and Skylights**

1. Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 4 feet (4') above lower levels, by elevated construction, personal fall arrest systems, covers, or guardrail systems erected around such openings.
2. Due to the small diameter of opening Solar Tubes are not normally guarded.

#### **D. Formwork and Reinforcing Steel**

1. Each employee performing a construction- related task on the face of formwork or reinforcing steel shall be protected from falling 6 feet (6') or more to lower levels by personal fall arrest systems, or positioning device systems.
2. Each employee performing a construction-related task on the face of formwork or reinforcing steel shall be connected to the face or form by a double-leg bridle (lanyard) that ensures a positive tie-off while the employee is moving on the face or form.

#### **E. Ramps, Runways, and Other Walkways**

1. Each employee on ramps, runways, and other walkways shall be protected from falling 4 feet (4') or more to lower levels by guardrail systems.

#### **F. Excavations and Trenches**

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 9 of 23
------------------------------------	------------------	-------------------------	------------------------------------	-----------------

1. Each employee performing a construction related task at the edge of an excavation 6 feet (6') or more in depth shall be protected from falling by guardrail systems, fences, or barricades.

#### **G. Open Shafts**

1. Each employee at the edge of a well, pit, shaft, and similar excavation 4 feet (4') or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.

#### **H. Equipment**

1. Each employee *less than* 4 feet (4') above dangerous equipment shall be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards or shall be protected from fall hazards by guardrail systems or personal fall arrest systems.

#### **I. Roofing**

##### **1. Low Slope**

Employees engaged in roofing work only on low-slope roofs with unprotected sides and edges 6 feet (6') or more above lower levels shall be protected from falling by guardrail systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or, on roofs 50-feet or less in width the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.

##### **2. Steep Slope**

Each employee on a steep roof with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by guardrail systems with toeboards, or personal fall arrest systems.

#### **J. Wall Openings**

1. Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 4 feet (4') or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (39") above the walking/working surface, shall be protected from falling by the use of a guardrail system, or a personal fall arrest system.

#### **K. Protection from Falling Objects**

1. Each employee exposed to falling objects must wear a hard hat, and one of the following must be done:
  - a. Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher levels; or,

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 10 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

- b. Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or,
- c. Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.

#### **L. Guardrail Systems**

1. Guardrail System shall consist of top rail members at 42 inches (42") plus or minus 3 inches (3") above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this section. Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (200lbs.) applied within 2 inches (2") of the top edge, in any outward or downward direction, at any point along the top edge.
2. Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (21") high. Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds (150lbs.) applied in any downward or outward direction at any point along the midrail or other member.
3. Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (19") apart. Other structural members (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches (19") wide.
4. Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing. The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.

#### **M. Personal Fall Arrest Systems**

1. All components of a Personal Fall Arrest System (PFAS) shall be inspected before each use, by the employee for wear, damage and other deterioration, and defective components shall be removed from service. The manufacturer of the PFAS may indicate an "End-of-Service" lifespan for the equipment. If so indicated, the PFAS equipment shall be removed from service by the department in accordance with manufacturer direction.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 11 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

2. Personal Fall Arrest Systems (Harness and Lanyards) shall be stored away from sunlight and shall be organized and hung in vertical manner in direct employee access to Fall Arrest Equipment Inspection Logs.
3. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system. D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds (5,000lbs.) D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (3,600lbs.) without cracking, breaking, or taking permanent deformation.
4. Snap hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook by depression of the snap hook keeper by the connected member, and shall be 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.
5. **Effective January 1, 1998, only locking type snap hooks shall be used.** *Unless* the snap hook is a locking type and designed for the following connections, snap hooks shall not be engaged:
  - a) directly to webbing, rope or wire rope;
  - b) to each other;
  - c) to a D-ring to which another snap hook or other connector is attached;
  - d) to a horizontal lifeline; or
  - e) to any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself.
6. Horizontal lifelines shall be designed, installed, and used, under the supervision of a Competent 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 (5,000lbs.).
7. Each employee shall be attached to a separate lifeline. Lifelines shall be protected against being cut or abraded.
8. Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet (2') or less shall be capable of sustaining a minimum tensile load of 3,000 pounds (3,000lbs.) applied to the device with the lifeline or lanyard in the fully extended position. Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (2') or less, ripstitch

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 12 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds (5,000lbs.) applied to the device with the lifeline or lanyard in the fully extended position.

9. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.
10. 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 (5,000lbs.) per employee attached
11. Personal fall arrest systems, when stopping a fall, shall:
  - a. Limit maximum arresting force on an employee to 900 pounds (900lbs.) when used with a body belt (Positioning Device);
  - b. Limit maximum arresting force on an employee to 1,800 pounds (1,800lbs.) when used with a full body harness;
  - c. Be rigged such that an employee can neither free fall more than 6 feet (6'), nor contact any lower level;
  - d. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (3.5') and;
  - e. Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of 6 feet (6'), or the free fall distance permitted by the system, whichever is less.
12. **Note:** If the system is used by an employee having a combined tool and body weight of 310 pounds (310lbs.) or more, then the employer must appropriately modify the criteria and protocols of the Appendix to provide proper protection for such heavier weights, or the system will not be deemed to be in compliance.
13. The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, When utilized as part of a positioning device, the attachment points shall be in the center of the employees back at the belt line, or dual attachment points at each hip. PFAS components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.
14. Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall be discarded by the department.
15. The department shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 13 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

16. Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists, unless approved for use by the manufacturer as a fall protection anchor point and designed and certified as part of a fall protection program for use as an anchor point. When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

**17. As of January 1, 1998, the use of safety body belts as part of a Personal Fall Arrest System will be prohibited.**

**N. Positioning Device Systems**

1. Positioning device systems and their use shall conform to the following provisions:
  - a. Positioning devices shall be rigged such that an employee cannot free fall more than **two feet (2')**.
  - b. Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (3,000lbs.) whichever is greater.
  - c. Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
  - d. Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.
  - e. Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (5,000lbs.).
  - f. D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (3,600lbs.) without cracking, breaking, or taking permanent deformation.
  - g. Attachment point(s) shall be at the center of the employees back at the belt line or at each of the employee's hips.
  - h. Snap hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook by depression of the snap hook keeper by the connected member, or shall be 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.
2. **As of January 1, 1998, only locking type snap hooks shall be used.**

**O. Warning Line Systems**

1. Warning line systems and their use shall comply with the following provisions:

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 14 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

- a. The warning line shall be erected around all sides of the roof work area.
  - b. When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet (6') from the roof edge.
  - c. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (6') from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (10') from the roof edge which is perpendicular to the direction of mechanical equipment operation.
  - d. Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.
2. Warning lines shall consist of ropes, wires, or chains and supporting stanchions erected as follows:
- a. The rope, wire, or chain shall be flagged at not more than 6-foot (6') intervals with high-visibility material;
  - b. The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (34") from the walking/working surface and its highest point is no more than 39 inches (39") from the walking/working surface;
  - c. After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (16lbs.) applied horizontally against the stanchion, 30 inches (30") above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;
  - d. The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (500lbs.) and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in paragraph 3 of this section; and
  - e. The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.
  - f. No employee shall be allowed in the area between a roof edge and a warning line unless the employee is performing roofing work in that area.
  - g. Mechanical equipment on roofs shall be used or stored only in areas where employees are protected by a warning line system, guardrail system, or personal fall arrest system.

**P. Controlled Access Zones**

1. Controlled Access Zones and their use shall conform to the following provisions:

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 15 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

- a. When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.
  - b. When control lines are used, they shall be erected not less than 6 feet (6') nor more than 25 feet (25') from the unprotected or leading edge.
  - c. The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
  - d. The control line shall be connected on each side to a guardrail system or wall.
2. Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
    - a. Each line shall be flagged or otherwise clearly marked at not more than 6-foot (6') intervals with high-visibility material.
    - b. Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (39") from the walking/working surface.
    - c. Each line shall have a minimum breaking strength of 200 pounds (200lbs.).

#### **Q. Safety Monitoring Systems**

1. The employer shall designate a competent person to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements:
  - a. The safety monitor shall be competent to recognize fall hazards;
  - b. The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;
  - c. The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee being monitored;
  - d. The safety monitor shall be close enough to communicate orally with the employee; and
  - e. The safety monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function.
2. No employee, other than an employee engaged in roofing work [on low-sloped roofs] shall be allowed in an area where an employee is being protected by a safety monitoring system.

#### **R. Covers**

1. Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover. All other covers shall be capable of supporting, without failure, at least twice the weight of

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 16 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

employees, equipment, and materials that may be imposed on the cover at any one time.

2. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees. All covers shall be color coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.
3. Note: This provision does not apply to cast iron manhole covers or steel grates used on streets or roadways.

**S. Material Storage During Roofing Work**

1. Materials and equipment shall not be stored within 6 feet of a roof edge unless guardrails are erected at the edge. Materials which are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.

**7.0 Advice and Counsel**

Central Safety Services shall provide advice and counsel on this procedure.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 17 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

## Personal Fall Arrest System Inspection Process

### **Harness Inspection**

1. **Webbing**—Grasp the webbing with your hands 6 inches to 8 inches apart. Bend the webbing in an inverted "U". The surface tension resulting makes damaged fibers or cuts easier to detect. Follow this procedure for the entire length of the webbing, inspecting both sides of each strap. Look for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage
2. **D-Rings**—Check D-rings for distortion, cracks, breaks, and rough or sharp edges. The D-ring should pivot freely.
3. **Attachment of Buckles**—Inspect for any unusual wear, frayed or cut fibers, or broken stitching of the buckle or D-ring attachments.
4. **Tongue/Grommets**—The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Webbing should not have additional holes punched.
5. **Tongue Buckles**—Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on the frame. Check for distortion or sharp edges.
6. **Friction and Mating Buckles**—Inspect the buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment point at the center bar.

### **Lanyard Inspection**

When inspecting lanyards, begin at one end and work to the opposite end, slowly rotating the lanyard so that the entire circumference is checked.

1. **Hardware**
  - a. *Snaps*: Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.
  - b. *Thimbles*: The thimble must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 18 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

2. **Steel Lanyard**—While rotating the steel lanyard, watch for cuts, frayed areas, or unusual wearing patterns on the wire. Broken strands will separate from the body of the lanyard.
3. **Web Lanyard**—While bending webbing over a pipe, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks and charring are obvious signs of chemical or heat damage. Observe closely for any breaks in stitching.
4. **Rope Lanyard**—Rotation of the rope lanyard while inspecting from end-to-end for any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period.
5. **Shock Absorber Pack**—The outer portion of the pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to D-rings. Belts, or lanyards should be examined for loose strands, rips, and deterioration.
6. **Shock-Absorbing Lanyard**—Shock-absorbing lanyards should be examined as a web lanyard (described in Item 3 above). However, also look for the warning flag or signs of deployment. If the flag has been activated, remove this shock-absorbing lanyard from service.

### **Cleaning**

Basic care of all safety equipment will prolong the durable life of the unit and will contribute toward the performance of its vital safety function. Proper storage and maintenance after use are as important as cleaning the equipment of dirt, corrosives, or contaminants. Storage areas should be clean, dry and free of exposure to fumes or corrosive elements.

**Nylon or Polyester**—Remove all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a lather with a vigorous back and forth motion; then wipe with a clean cloth. Hang freely to dry, but away from excessive heat.

**Drying**—Equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight.

## Full Body Harness Pre-use 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	
Overall disposition:	Accepted  Rejected	Inspected By:  Date Inspected:

## Full Body Harness 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  Rejected	Inspected By:  Date Inspected:

## 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	
Overall disposition:	Accepted  Rejected	Inspected By:  Date Inspected:

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

Subject: <b>Fall Protection</b>	Number: S-004	Rev. January 1, 2013	Effective Date: January 1, 1997	Page 23 of 23
------------------------------------	------------------	-------------------------	------------------------------------	------------------

**APPENDIX**  
**OSHA Standards Related to Falls**  
Construction Industry Standards

29 CFR 1926.106 -- Working Over or Near Water

29 CFR 1926.451 -- thru 453 (Subpart L) -- Scaffolding

29 CFR 1926.550 -- thru 556 (Subpart N) Cranes, Derricks, Hoists, Elevators and  
Conveyors

**29 CFR 1926.500 -- thru 503 (Subpart M) -- Fall Protection**

29 CFR 1926.650 -- thru 652 (Subpart P) -- Excavations

29 CFR 1926.753 (Subpart R) -- Steel Erection, Safety Nets

29 CFR 1926.800 -- Underground Construction

29 CFR 1926.850 -- thru 859 (Subpart T)--Demolition

29 CFR 1926.959 (Subpart V) -- Lineman's body belts, safety straps, and lanyards.

29 CFR 1926.1050 -- thru 1060 (Subpart X) -- Stairways and ladders

**General Industry Standards**

29 CFR 1910.21 -- thru 32 (Subpart D) Walking and Working Surfaces

29 CFR 1910.66 -- thru 68 (Subpart F) Powered Platforms, Manlifts, and Vehicle-  
Mounted Work Platforms.

29 CFR 1910.146 -- Permit-required confined spaces

**Non-OSHA Considerations**

Chapter 25 Tucson City Code

PART VI OF MUTCD