

FALL PROTECTION

Scope and Application

The purpose of this procedure is to provide criteria for the recognition and control of fall hazards. This procedure applies to all facilities and field operations where personnel could be exposed to fall hazards of 4 feet or greater.

Implementation

Implementation of this procedure is the responsibility of the Location Manager.

Procedure

1.0 Training

- A. Designate a competent person to provide training in fall hazard recognition to each employee and their supervisor who may be exposed to falls.
 - 1. The competent person must be 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
 - c) The use and operation of guardrail, personal fall arrest, safety net, warning line, and safety monitoring systems, controlled access zones, and other protection systems to be used
 - d) The role of each employee in the safety monitoring system, when used
 - e) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs or falls from heights less than 10 feet
 - f) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
 - g) The role of employees in fall protection plans
 - h) Use of fall protection equipment, manufacturer limitations, and fall protection standards
- B. Prepare a written certification record which includes the name of the employees trained, the date(s) of training, and the signature of the person who conducted the training.
- C. Provide retraining when one of the following situations occur:
 - 1. Changes in the workplace render previous training obsolete.
 - 2. Changes in the types of fall protection systems or equipment to be used render previous training obsolete.
 - 3. Inadequacies in affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

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2.0 Fall Protection – General

- A. Require that one or more of the fall protection/prevention systems outlined in this procedure is provided at **all** locations where fall hazards of 4 feet or greater exist.
 - 1. These locations include, but are not limited to:
 - a) Excavations
 - b) Unprotected elevation
 - c) Ladders
 - d) Scaffolds
 - e) Floor holes
 - f) Wall openings
 - g) Formwork
 - h) Rebar tying
 - i) All other locations and operations where potential fall hazards exist

3.0 Guardrail Systems

- A. Provide guardrail systems, when feasible, at all locations where a fall hazard of 4 feet or greater exists.
 - 1. Where guardrail systems are impractical, an alternative form of fall protection as outlined elsewhere in this procedure must be provided.
 - 2. Require that guardrail systems meet the following criteria:
 - a) Top rails must be installed 42 inches above the walking/working surface and be capable of withstanding, without failure, a minimum force of 200 pounds in any outward or downward direction with no more than 3 inches of deflection.
 - b) Mid rails must be installed 21 inches above the walking/working surface and be capable of withstanding, without failure, a minimum force of 150 pounds in any outward or downward direction.
 - c) Posts must be spaced not more than 8 feet apart on centers.
 - d) There are no openings more than 19 inches wide in any guardrail system.
 - e) Do not use plastic or steel banding as top rail or.
 - f) Provide top rails and mid rails of at least one-quarter inch nominal thickness or diameter, and smoothly surfaced to prevent cuts and punctures.
 - g) Flag the top rail with high-visibility material when using wire rope for top rails.
 - i) Erect guardrails on all sides when using guardrail systems around holes.
 - j) When guardrails are used around holes that are used for access, such as ladder ways, provide a gate or offset the guardrail so that a person cannot walk directly into the hole.

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- k) When guardrails are used at hoisting areas, place a chain, gate, or removable guardrail section across the access point when hoisting operations are not taking place.
- l) Provide guardrail systems at **all** locations above dangerous equipment, whether 4 feet or not.
- m) Provide guardrails at all wall openings where the outside bottom edge of the opening is 4 feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface.
- n) Erect guardrail systems on all unprotected sides or edges of ramps and runways when such systems are used.

4.0 Personal Fall Arrest Systems

- A. Provide and require the proper use of personal fall arrest systems on all unprotected elevations 4 feet or more above a lower level.
 - 1. Where these systems are impractical, an alternative form of fall protection as outlined elsewhere in this procedure must be provided.
 - 2. All aspects of personal fall protection systems must be designed, installed, and used under the supervision of a qualified person.
 - 3. Maintain a safety factor of at least 2 in all components of a personal fall protection system.
- B. Safety belts (body belts) are prohibited.
 - 1. Use only full body harnesses, shock-absorbing lanyards, horizontal lifelines, self-retracting lifelines and anchorage points which meet the following criteria:
 - a) Body harness design and construction must meet the specifications set forth in current ANSI Standards.
 - b) All snaphooks must be of the double locking type.
 - c) Ropes and webbing used in lanyards and body harnesses must be made of synthetic fibers.
 - d) The attachment point (dee-ring) of a body harness must be located in the center of the wearer's back near shoulder level.
 - e) Horizontal lifelines must be designed, installed, and used under the supervision of a qualified person; be capable of supporting at least 5,000 pounds per employee attached; and maintain a safety factor of at least 2.
 - f) Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.
 - g) Self-retracting lifelines and lanyards which limit free fall to 2 feet or less must be capable of sustaining a minimum tensile load of 3000 pounds in the fully extended position.
 - h) Self-retracting lifelines and lanyards which do not limit free fall to 2 feet or less, ripstitch, and other shock-absorbing lanyards must be capable of sustaining a minimum tensile load of 5,000 pounds in the fully extended position.

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- C. Anchorage points for personal fall protection systems must be independent of any anchorage point being used to support or suspend platforms and must be capable of supporting at least 5,000 pounds per employee attached.
- D. Inspect all fall protection components for wear, damage, and deterioration prior to each use.
- E. Require employees to be familiar with the fitting and donning of body harnesses; proper tie-off techniques, and suitable anchorage points.
 - 1. Instruct employees to rig fall protection such that they can neither free fall more than 4 feet, nor contact any lower level.
 - 2. Never tie off to guardrail systems or hoists.
 - 3. Require employees to remain tied off 100% of the time when at or above 4 feet by means of horizontal lifelines, vertical lifelines, a double lanyard system, or other suitable means.
- F. Remove from service any component of a personal fall protection system that has been subjected to impact loading and do not use again until inspected by a competent person and determined to be undamaged and suitable for reuse.
 - 1. Most modern equipment is not intended for reuse following a fall and should be replaced every 5 years after the first use.
- G. Make provisions for the prompt rescue of personnel in the event of a fall, or require that employees are capable of self-rescue.
- H. Provide separate vertical lifelines for each employee using a vertical lifeline. 5/8-inch nylon rope is recommended for lifeline use.
- I. Protect lifelines against cuts and abrasions.
 - 1. Use rope grabs to attach to vertical lifelines
 - a) Never use knots.
 - 2. Ensure that the rope grab is compatible with the vertical lifeline being used.

5.0 Safety Net Systems

- A. Provide safety net systems at locations where a fall hazard of 4 feet or greater exists, and other forms of fall protection are not feasible.
 - 1. Where safety net systems are impractical, an alternative form of fall protection as outlined elsewhere in this procedure must be provided.
 - 2. Require that safety net systems meet the criteria set forth in current OSHA standards.
- B. Install safety nets as close as possible under the walking/working surface on which employees are working, but never more than 30 feet below this level.
- C. Require that the potential fall area from the walking/working surface to the net is unobstructed.
- D. Install safety nets with enough clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified below.

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1. Extend the outer edge of the net 8 feet from the edge of the working surface when the vertical distance from the working level to the net is 5 feet or less.
 2. Extend the outer edge of the net 10 feet from the edge of the working surface when the vertical distance from the working level to the net is 5 feet to 10 feet.
 3. Extend the outer edge of the net 13 feet from the edge of the working surface when the vertical distance from the working level to the net is greater than 10 feet.
 4. Conduct a drop test of the safety net after installation and before being used as a fall protection system; whenever relocated; after major repair; and at 6-month intervals if left in one place.
 5. Conduct the drop test by dropping a 400 pound sandbag, 30 inches in diameter, into the net from at least 42 inches above the highest walking/working level at which employees are exposed to a fall.
 6. Inspect safety nets at least once a week, and after any occurrence that could affect the integrity of the system, for wear, damage, and deterioration. Remove defective nets and components from service.
- E. Remove all materials, scrap, equipment, and tools which have fallen into the net as soon as possible, but at least before the next work shift.

6.0 Hole Covers

- A. Provide covers in roadways and vehicle aisles that are capable of supporting at least twice the maximum axle load of the largest vehicle expected to cross over the cover.
 1. Provide walking/working surface hole covers that are capable of supporting at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.
- B. Secure covers at the time of installation to prevent displacement by the wind, equipment, or employees.
- C. Color code or mark all hole covers with the word "HOLE" or "COVER" to provide warning of the hazard.
- D. Safety Monitoring Systems, Warning Line Systems, and Controlled Access Zones
 1. Consult the competent person and local OSHA codes prior to performing any roofing, overhand bricklaying, leading edge, or other elevated work which may require the use of one or more of these systems.

7.0 Protection from Falling Objects

- A. Install toe boards along the edge of the overhead walking/working surface.
 1. Require that toe boards:
 - a) Are a minimum of nominal height of 3 1/2 inches in height

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- b) Are capable of withstanding at least 50 pounds of force applied in any downward or outward direction
 - c) That there is no more than ¼ inch clearance between the toe board and the walking/working surface.
- B. Install paneling or screening from the top of the toe board to the top rail or mid rail when tools, equipment, or materials are piled higher than the top of the toe board.

8.0 Documentation Summary

- A. Place in the Project Safety Files:
- 1. Competent Person Qualifications
 - 2. Employee Training Documents