



SECTION 8

FALL PROTECTION PROGRAM



1. FALL PROTECTION

- A. OSHA References:** 29 CFR 1926 Subpart M (500- 503)
- B. General:** The purpose of this program is to prevent work-related injuries resulting from falls. The prevention of these incidents will be accomplished by the use of fall prevention and fall arrest methods, the training of affected employees and aggressive enforcement by all levels of management. In addition

The fall protection plan shall be prepared by a qualified / competent person for the specified work site prior to the start of the work.

- C. Application:** This policy applies to all company employees who may be exposed to fall hazards in the course of their daily activities. This program also applies to non-site personnel, visitors or any individual on site exposed to a fall hazard. Fall protection is required at elevations of **6 ft. or greater** for the following work activities.

Examples of areas where employees may have to be protected include but are not limited to the following:

1. Leading edges
2. Hoist areas
3. Holes in walk surface
4. Framework and reinforcing steel
5. Ramps, runways, and other walkways
6. Excavations
7. Working over Dangerous equipment
8. Roofing work on low or steep sloped roofs
9. Precast concrete construction
10. Wall openings
11. Scaffolds
12. Aerial lifts
13. Overhand brick laying

- D. Subcontractor's Plans:** Subcontractor plans will meet or exceed the requirements of this program. Plans must be submitted to the company project manager before beginning work. Plans must identify the person or persons responsible for monitoring the safety of the employees. (Competent Person). Site-specific plans must be submitted for any specialized fall protection. In an example:

1. Controlled access zones
2. Warning line system
3. Safety Monitoring System



- E. Responsibilities:** In addition to responsibilities previously outlined in the Site Safety Program, the Safety Director or designated competent person for fall protection will be responsible for the training of all effected company employees and enforcement of the company policy). Competent persons must be able to recognize, warn and communicate with employees that may be exposed to a fall. Also, the competent person must be designated and assigned the task and be able to accomplish the following while workers are exposed:
1. Recognize fall hazards
 2. Warn employees if they are unaware of a fall hazard or is acting in an unsafe manner
 3. Be on same working surface and in visual sight
 4. Stay close enough for verbal communication
 5. Not have another assignment that would take monitors attention from monitoring the function.
- F. Training:** The instructor shall be adequately trained in the fall protection system in use and shall be responsible for training all potentially exposed employees during the new employee orientation. In the event a new system is employed, additional training on this system will commence immediately for all effected employees.
1. Training will include, at a minimum:
 - a) The company fall program requirements.
 - b) Identification and elimination of fall hazards on the job site.
 - c) Safe work in hazardous areas.
 - d) Hazards associated with working near fall hazards.
 - e) Selection, use, care and inspection of fall protection equipment.
 2. All training must be documented in the following manner:
 - a) The date of training.
 - b) The employees printed name and signature.
 - c) The printed name and signature of trainer.
 - d) The specific subjects covered in the training session.
 - e) Testing results (if any).
- G. Retraining:** When the employer has reason to believe that any effected employee who has already been trained does not have the understanding and skill required under employee training, the employer shall retrain each such employee. Circumstances where retraining is required include:
1. Changes in the work place were previous training is obsolete.



2. Changes in the type of fall protection systems or equipment were previous training is obsolete.
3. Inadequacies in an employee knowledge or use of fall protection system or equipment indicate that the employee has not retained the training provided.

H. Accountability and Enforcement: All field personnel will be held accountable for the enforcement and compliance with this program. Documented safety inspections, repeat discrepancies, accident investigation and implementation of accident investigation recommendations will provide the criteria for effectiveness of enforcement. Failure to comply with this policy will result in the following:

1. **First offense:** A written warning notice will be issued to the employee or employing subcontractor.
2. **Second offense:** The employee will be dismissed from the work site.
3. **Subcontractors:** Subcontractor's who fail to effectively enforce fall protection requirements or whose employees consistently violate fall protection requirements will be requested to leave the work site for failure to comply with contract requirements.

I. Hazard Identification And Elimination:

1. Compliance with fall protection requirements will be a mandatory item for all documented safety inspections. Fall protection inspections will focus on the following hazards:
 - a) Scaffolds
 - b) Ladders
 - c) Steel Erection
 - d) Roofing
 - e) Floor holes
 - f) Open sided floors
 - g) Aerial lifts
2. The hazard identification process shall begin in the pre-bid phase with review of the scope of work, blue prints and drawings. Where feasible, pre-planning will be accomplished to prevent employees from being exposed to fall hazards. The following pre-planning steps must be considered:
 - a) Order and install stairways with the guardrails already attached.
 - b) Request the designer/architect specify proper anchor points for fall arrest systems.



- c) Do not cut opening in the floors or ceilings until the material is being installed, eliminating the need for hole covers. Attach all guardrails on open sided floors before employees are allowed to work on that level.
 - d) Install stairs, guardrails, and other fall protection equipment early in the construction phase.
 - e) Require subcontractors to install fall protection systems on horizontal industrial steel prior to installation.
 - f) Maximize on ground assembly of structure or equipment.
 - g) Plan for the utilization of aerial lifts for all steel erection and concrete pre-cast erection.
 - h) Controlled access zones are not allowed for leading edge operation at company locations. The work method employed will include a horizontal lifeline behind the leading edge, designed for multiple employees, with retractable lanyards attached for employees working on the leading edge. Equipment used will not allow employee to travel into the fall zone of a leading edge.
3. When no other above-mentioned methods have been implemented a safety monitoring system shall be put in place.

J. Conventional Fall Protection:

1. **Guardrails:** Guardrail systems incorporate a top rail at 42 inches, plus or minus 3 inches above the working platform, mid-rail and toe board. On all company projects, guardrails will be constructed of 2" X 4" construction grade lumber with posts no more than 8 feet on center; 1/4" or greater wire cable, flagged every 6 feet with high visibility material; or 1.5 inch nominal diameter schedule 40 pipe with posts spaced no more than 8 foot on center. All guardrails shall be capable of supporting a 200-pound force in any direction with a maximum deflection of 3 inches. These guardrails will be placed in the following areas:
 - a) All stair systems.
 - b) All open sided floors.
 - c) Around all holes which are too large for hole covers.
 - d) On all elevator shaft openings.
 - e) On all excavations over six feet in elevation.
 - f) All scaffolding with working platforms over 6 feet.
2. **Safety Nets:** Safety nets will be used only during steel erection activities, when working over water and on unique projects when other conventional systems (such as guardrails, hole covers, etc.) are not feasible. In the vent safety nets are employed, the following guidelines will be used:



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- a) Nets will be installed as close as possible under walking/working surface, but in no case will an employee be exposed to a fall of greater than 30 feet.
- b) Safety Nets will extend outward from the outer most edge of the work surface in the following manner:



Fall Distance	Extension
Up to 5' fall	8 foot extension
More than 5' to 10' fall	10 foot extension
More than 10' (do not exceed 30')	13 foot extension

c) Nets shall be installed in a manner that will prevent an individual from striking any object below the net.

3. Nets will be installed, tested and inspected by a competent person. All nets will be initially drop tested with a 400 pound bag of sand as specified in the OSHA standard and tested each week thereafter. Results of the tests will be documented. Where tests are not feasible, a competent person must certify the compliance of the net.
4. Site safety personnel will inspect nets each day. Results of inspections shall be documented.
5. Nets will be inspected after any occurrence, which could affect its integrity, such as a steel member falling into the net or shock loading due to a fall.
6. Any materials, tools, scrap or equipment that falls into the net must be removed as soon as possible, but no later than the end of the work shift.
7. Safety net design and connections shall comply with OSHA standards and manufacturers recommendations.
8. Nets that are found to be out of compliance will be immediately identified and no work will be performed until the compliance issues are resolved.

K. Hole Covers: A hole is defined as a gap or void 2 inches or more in its least dimension in a floor, roof or other walking /working surface. Employees must be protected from falling into or through holes, including skylights that are 6 feet or more above lower levels. Where holes exist, they must be equipped with guardrail systems as described above or covered with a hole cover as described below:

1. Hole covers will be capable of supporting two times the maximum intended load. (For roadways and vehicles, two times the maximum axle load of the largest vehicle expected to pass). For plywood hole covers, the minimum requirement is $\frac{3}{4}$ CDX plywood.
2. All covers must be secured when installed so that wind, equipment or employees will not displace them.
3. All covers must have the words "DANGER – HOLE COVER" written on them in high impact, durable color.
4. All covers must be installed to eliminate any tripping hazard.



L. PERSONAL FALL ARREST SYSTEMS/EQUIPMENT:

1. **Harness and Lanyard:** Only 4 point suspension harness and shock absorbing lanyards shall be used. Lanyards shall be equipped with locking snap hooks.
 - a) The designated competent person shall inspect equipment at time of issue and periodically throughout the project. The using employee shall inspect for defect and condition prior to use and on return after use. Damaged or defective equipment shall be tagged and removed from the work site or destroyed and disposed. Shock absorbing lanyards and harness that have experienced a shock load; pitting, chaffing, burn holes or chemical exposure shall be immediately destroyed and disposed to prevent accidental use.
 - b) All harnesses shall be properly fitted and worn. Equipment users shall be trained and instructed in the proper selection, care, use and inspection of fall protection equipment.
 - c) Caution shall be used in selection of all fall protection equipment to ensure the proper length and application. Swing distance shall be considered when selecting connection points and lanyard or tether length.
 - d) Fall protection anchor points shall be capable of sustaining 5000 lbs.
 - e) Specifically engineered slings and or chokers used to provide anchor points for lanyards shall not extend the fall distance beyond 6 foot.

Note: All PFAS materials used shall meet or exceed all applicable ANSI and ASTM standards

2. **Self Retracting Lifelines:**
 - a) Self-retracting lifelines are part of a complete fall protection system, which automatically limits the free fall distance to 2 feet or less, consists of:
 - (1) An anchorage point capable of supporting 5000 lbs.
 - (2) A locking type connector to mount the device to the anchorage point.
 - (3) The self re-tracting lifeline with locking snap hook.
 - (4) A 4 point suspension harness
 - b) The installation of this device shall be directly over the work area.



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- (1) Attached to an anchor point that is capable of sustaining 5000lbs.
 - (2) Attached by locking snap hook to the harness "D" ring in the center of the wearers back.
 - (3) Only one individual may be attached per unit.
- c) Before use, the unit shall be inspected for any indication of damage, wear or malfunction including worn cable or damaged locking snap hook.
- (1) Pull approx. four feet of cable out of the housing and allow to retract. Maintain a slight tension on the cable. The cable shall retract smoothly and completely. **DO NOT ALLOW THE CABLE TO RETRACT FREELY.**
 - (2) Repairs and adjustments may not be accomplished in the field. Malfunctioning units will be tagged "do not use" and removed from the site immediately. Equipment subjected to a shock load will be tagged and removed from the site immediately.

Note: All PFAS materials used shall meet or exceed all applicable ANSI and ASTM standards.

M. Selection And Installation Of Anchorage Points:

1. The selection of the proper anchorage point is critical to the effectiveness of fall protection. Anchorage points shall be:
 - a) Capable of sustaining a load of 5000 lbs.
 - b) Located equal to or above the point of operation.
 - c) Located above the work area to minimize or eliminate "swing" in the event of fall.
2. Anchorage points should be identified and installed prior to lifting and setting equipment in place.
3. Anchorage points selected should be positioned to allow employees to immediately connect fall protection equipment without unprotected travel from anchorage point to anchorage point.

N. Personal Fall Restraint System: A fall restraint system physically restricts or stops the fall before it occurs. For example, a harness with a cable attached, which is short enough to halt the employee before they step over an open-sided floor is considered a fall restraint system. Fall restraint systems will meet the same requirements of the positioning system and personal fall arrest system. The anchorage point, however, must be capable of supporting 200 pounds.



- O. Positioning System:** Positioning systems shall conform to the following provisions:
1. Positioning devices shall be rigged to prevent a free fall more than 2 feet.
 2. Shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3000 lbs, which ever is greater.
 3. Connectors shall be equipped with locking snap hooks and sized to be compatible with the member to which they are connected.



2. FLOOR AND WALL OPENINGS: Slips, trips and falls are well known causes of workplace injuries. These injuries occur when employees fall through floor opening/wall openings. This section provides general guidelines for guarding off floor and wall openings. It is not possible, however, to cover all potential areas of concern. The OSHA Standard, other sections of barricading, housekeeping, etc., in this manual and our client procedures are additional resources and should be consulted.

A. General:

1. All workplaces, passageways, storerooms and service rooms must be kept clean and orderly and in a sanitary condition.
2. Floors must be maintained and drainage, platforms or mats must be provided for wet surfaces.
3. Floors must be free from protruding nails, splinter, holes, loose boards, etc.
4. Aisles and passageways must allow sufficient safe clearances for handling equipment, i.e. forklifts, hand trucks, pallet jacks, etc. They must be kept clear and in good condition.
5. Permanent aisles and passageways must be marked.
6. Cover and guardrails must be provided for open pits, tanks, vats, ditches, etc.
7. A load placed on any floor, roof, or other structure greater than that approved by the building official or indicated on the load approval plates installed on the facility.

B. Guarding Floor Openings And Holes:

1. All floor openings large enough for an employee's foot to enter must be covered.
2. Stairway floor openings must be guarded with standard railings.
3. Ladder way openings or platforms must be guarded by a standard railing and toe board on all exposed sides.
4. Entrances to ladders from platforms or ladders from platforms must be guarded by a swinging gate or offset to prevent walking into the opening.
5. Hatchways and chute openings must be guarded by hinged floor coverings or removable railing with toe boards.
6. Hatchways equipped with hinged covers must be guarded when open.
7. Skylight floor openings and holes must be guarded by standard screens or railings.
8. Pits and trap door openings must be guarded by covers. When the cover is open, a person must constantly guard the hazard.
9. Manhole openings must be guarded by covers. When the cover is open, a person must constantly guard the hazard.



10. Temporary opening guarded must be guarded by a person in attendance.
11. Floor holes with fixed machinery must be protected so that there is no opening greater than 1 inch.
12. Platform doors or gates that open directly on stairways must not reduce the effective platform width to less than 20 inches.

C. Wall Openings (30 Inches High and 18 Inches Wide): These guidelines apply to wall openings with a drop of four (4) feet or more.

1. Openings must be guarded by rail, fence, barrier, and a removable toe board.
2. A grab handle will be provided on each side of the opening approximately four (4) feet above the floor.
3. Guards must be provided for extension platforms.
4. Chute wall openings must be guarded.
5. Window openings with a drop of over four (4) feet and less than three (3) feet above the platform must be guarded with standard grills or slats.
6. Temporary wall openings must be guarded.
7. If materials can fall through wall holes, toe boards or screens must be provided.

D. Open-Sided Floors, Platforms and Runways: These guidelines apply when the open sided floor, platform or runway is four (4) feet or above ground.

1. Standard railing must be provided.
2. Toe boards must be provided if persons can pass beneath the opening, moving machinery is beneath the opening, or equipment is in a position that would create a hazard if contacted by falling materials.
3. Special purpose runways used for oiling, etc., over 18 inches wide, may be guarded on one side only when all other hazards are guarded against.
4. Standard railings must be provided above dangerous equipment i.e., tanks, vats, etc.

E. Stairways, Railings and Guards: Stairs with four or more risers must be provided with protection.

1. Stairs with a width of less than 44 inches must be provided with a handrail on the right side descending for enclosed stairs.
2. Stairs with a width of 44 inches must be protected on the open side.



3. Stairs of less than 44 inches must be protected on both sides when both sides are open.
4. Stairs of more than 44 inches and less than 88 inches must be protected on each side.
5. Stairs of more than 88 inches in width must be protected on each side and in the middle.
6. Winding stairs must be constructed so that the handrail prevents walking on tread with a width of less than 6 inches.

F. Standard Railings:

1. Standard railings consist of a top rail, intermediate rail (approximately halfway from surface to top rail), and posts and must be no higher than 42 inches.
2. Stair railing must not have a vertical height of more than 34 inches nor less than 30 inches.
3. Wood railings must be 2 inches by 4 inches and span must be six feet or less.
4. Pipe railings must not be less than 1 and ½ inches in diameter and the span must not be more than eight feet on center.
5. Structural steel railings must be 2 inches by 2 inches by 3/8 inches and span more than 8 feet on center.
6. Anchoring must be capable of withstanding 200 pounds applied to the top rail of approximately all railways.
7. Other acceptable railing must have a smooth-surfaced top rail, 200 pounds capacity and provide for equipment protection.

G. Toe Boards: Must be four inches in vertical height, and no more than ¼ inch clearance from the floor. **NOTE: More vertical clearance must be provided if materials are to be stacked above the toe board.**

H. HANDRAILS:

1. Attachments to handrails must offer no obstruction to the user.
2. They must furnish an adequate handhold.
3. They must present no projection hazards into the walking or working area.
4. The height of the handrail must not be more than 34 inches nor less than 30 inches.
5. Handrails must be capable of withstanding a 200-pound force.
6. Wood handrails must be 2 inches in diameter.
7. Pipe handrails must be 1 and ½ inches in diameter.
8. All handrails must provide a 3-inch clearance from any object or wall.



I. Floor Opening Covers:

1. Trench/conduit covers in roads must be able to withstand a rear axle load of 20,000 pounds.
2. Manhole covers must withstand 20,000 pounds.
3. Covers must not project more than one inch above floor and no more than 30-degree angle.
4. Sky light screens must be capable of withstanding a 200 pound load
 - a) Must be installed to prevent deflection to break glass.
 - b) The grillwork opening must not be more than 4 inches.
 - c) Slat work openings must not be more than 2 inches.
5. Wall opening rails must be capable of withstanding 200-pound load.
6. Wall opening grab handles must not be less than 12 inches.
 - a) Must provide for a 3-inch clearance.
 - b) Must allow for 3 inches of side clearance.
 - c) Must withstand a 200-pound load.
7. Wall opening screens must withstand a 200-pound load.
 - a) Grillwork opening must not be more than eight inches.
 - b) Slat work openings must not be more than four inches.

J. Fall Protection Equipment: All employees working in areas described in the preceding paragraphs and not protected in prescribed manner must be equipped with fall protection harness and lanyard. Care must be exercised in selection of shock absorbing lanyards to insure the proper length.

K. Replacement of Railings and Coverings: All rails, covers, etc., removed for equipment installations will be immediately replaced. In no event shall a floor or wall opening be left unattended or unguarded in the appropriate manner.

L. Accident Reporting: All accidents and serious incidents (near misses) must be reported immediately to the Site Supervisor. The Competent Person shall investigate; implement changes to the fall protection plan as necessary. The changes shall be communicated to all employees.

Maul Electric, Inc shall provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves