

## 12.1: Introduction to Fall Protection

### Introduction

Falls are the leading cause of worker fatalities in all industries but especially in the construction industry. OSHA's Fall Protection standard became effective on February 1995. The major parts of the Fall Protection standard are; Scope & Application, Duty to have Fall Protection, Fall Protection System Criteria and Practices, and Training Requirements.

An employer's responsibility is to first prevent falls from occurring at all, Maintaining work surfaces in good condition and providing physical supports for access to higher elevations and physical barriers along drop offs and leading edges is the primary method for controlling falls and preventing deaths.

### Applicable Regulations

The requirements of Subpart M, Fall Protection, apply to the construction industry. The provisions of Subpart M do not apply to employees who are making an inspection, investigation, or assessment of workplace conditions either before work begins or after work has been completed. However if these efforts are focused and laborious then fall protection should be considered.

Fall Protection requirements for employees working on scaffolds are included in Subpart L. Employees working on stairways and ladders are covered by Subpart X. Requirements for employees engaged in the construction of electric transmission and distribution lines are contained in Subpart V.

### Duty to Have Fall Protection

The Fall Protection standard sets up a uniform threshold height of six feet for determining when fall protection is required. The following activities require fall protection:

1. Leading Edges - Where employees are constructing a leading edge six feet or more above lower levels.
2. Walking/Working surfaces - Locations six feet or more above a lower level where the leading edge is under construction but the employee is not engaged in the leading edge work.
3. Hoist Areas - Employees working in a hoist area six feet or more above a lower level.
4. Holes - Employees shall be protected against falls through holes, including skylights, more than six feet above a lower level.
5. Form work and Reinforcing Steel - Employees on the face of formwork or reinforcing steel where the height is six feet or more above lower levels.
6. Ramps & Runways - Employees working on ramps or runways more than six feet above a lower level.
7. Excavations - Employees on the edge of an excavation six feet or more in depth.
8. Dangerous Equipment - Employees working less than six feet above dangerous equipment.
9. Overhead Bricklaying - Employees performing overhand bricklaying work more than six feet above lower levels.
10. Roofing work on low-slope roofs.
11. Steep Roofs.
12. Precast Concrete Erection.
13. Residential Construction.
14. Wall openings - Employees working on, at, above, or near wall openings where the outside bottom edge of the wall openings is six feet or more above lower levels.
15. Other walking/working surfaces not covered above.
16. Several of the activities contain an exception that permits the employees to work without fall protection when the employer can demonstrate that fall protection is infeasible or creates a greater hazard by its use.

### Falling Objects

Employers must also provide protection for employees who are exposed to falling objects, Exposed employees must wear a hard hat and one of the following three measures must be implemented:

1. Use toe boards, screen, or guardrail systems to prevent the objects from falling.
2. Use a canopy structure and keep objects far enough from the edge so they cannot accidentally be pushed over the edge.
3. Use a barricade system to prevent employees from entering areas where objects may fall.

## Covers

When covers are used to provide protection against holes in floors, roofs, and other working/walking surfaces, they shall meet the following criteria:

1. Covers must be secured when installed so as to prevent displacement by the wind, equipment or employees.
2. All covers shall be marked with the word "HOLE" or "COVER" or they shall be color coded to provide warning of the hazard.
3. Covers installed in roadways or 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.
4. All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment and materials that may be imposed upon the cover at any one time.

## Fall Protection System Criteria and Practices Guardrail Systems

### Definition

A barrier erected to prevent employees from falling to lower levels.

### Requirements

Where guardrail systems are used to meet the requirement of fall protection the guardrail system shall comply with all of the following provisions:

1. The top edge of the rail height shall be 42", plus or minus three inches.
2. Midrails, screens, mesh, vertical members or equivalent shall be installed between the top edge of the rail and the working surface unless a parapet wall of at least 21" is present. If vertical members are used they must not exceed 19" center to center spacing. If mesh is used it shall extend from the top rail to the working surface.
3. Guardrails must be capable of withstanding a 200lb. downward & outward force applied within two inches from the top rail at any point along the top edge.
4. When the 200lb. force is applied the top rail shall not be deflected to a height of less than 39" above the working surface.
5. Midrails, screen mesh, vertical members, panels, etc., shall be capable of withstanding a 150lb. force applied in any downward or outward direction.
6. Guardrail surfaces shall be free from any materials or rough edges that may cause punctures or lacerations or snagging of clothing.
7. The ends of the top rails and Midrails shall not overhang the terminal posts, unless the projection does not create a hazard.
8. Top rails shall not be constructed of steel or plastic banding.
9. The minimum diameter or thickness for top rails and Midrails is 1/4". If wire rope is used for the top rail it must be flagged at intervals not exceeding six feet with a high- visibility material.
10. Guardrail systems at holes shall be erected on all unprotected sides or edges of the hole.

## Safety Net Systems

### Definition

A system which utilizes a drop-tested net placed below the working surface to provide fall protection for employees.

### Requirements

Where safety net systems are used to meet the requirement of fall protection the safety net system shall comply with all of the following provisions:

1. Safety systems must be installed as close as practicable to the working surface. In no case shall the net be installed more than 30' below such level.
2. Safety nets must be installed so that they have sufficient clearance to prevent contact with structures below.
3. Safety nets shall be drop tested at the jobsite after the initial installation and before being used as a fall protection system. Safety nets must be retested after being relocated after major repair and at six-month intervals, if in one place.
4. Drop tests shall consist of a 400lb. bag of sand being dropped into the net from the highest surface at which employees will be working but in no case less than 42" above that level.
5. Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, or other deterioration.

6. Materials, scrap pieces, equipment and tools which have fallen into the net must be removed as soon as possible and at least before the next work shift.

The maximum size of safety net openings shall not exceed 36sq. inches. Individual openings shall not exceed six inches on any side.

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