Fall Protection in Construction

- §1926.500 Subpart M
Objectives

In this course, we will discuss the following:

- Emphasis on fall protection
- Subpart M requirements
- Applying fall protection standards to construction sites
Construction Fatalities (FY 2003-2008)

- 33% Falls
- 16% Crushed By
- 12% Electrocuted
- Struck By 30%
- Other 9%

5-Year Total: 130 Fatalities
Construction Fatalities

FY 2008: 17 Fatalities - 7 from Falls
Exception

- Covers all fall hazards *except* specific requirements found in:

  » Subpart L – Scaffolds
  » Subpart N – Certain cranes and derricks
  » Subpart R – Steel erection
  » Subpart S – Tunneling operations
  » Subpart V – Power transmission and distribution
  » Subpart X – Stairways and ladders

(cont…)}
Subpart M – Fall Protection 1926.500(a)(1)

Exception

The provisions of this subpart do not apply when employees are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.
Fall Exposure: Then and Now ... 

- **1969 Construction**
  
  Est. fall exposure
  - Drip edge = 11’
  - Roof peak = 16’

- **2008 Construction**
  
  Est. fall exposure
  - Drip edge = 23’
  - Roof peak = 38’
Fall Protection Requirements

- General Industry: 4’
- Construction Sites: 6’
- Steel Erection: 15’
  - Scaffolds: 10’
Duty to Have Fall Protection 1926.501(a)

- Employer required to provide fall protection systems

- Employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely
Should he have fall protection?
Fall Protection Required

1926.501(b)(1)-(15)

- Unprotected sides, edges
- Leading edges
- Hoist areas
- Holes
- Formwork, reinforcing steel
- Ramps, runways
- Excavations
- Dangerous equipment
- Overhand bricklaying
- Low-slope roofs
- Steep roofs
- Pre-cast concrete erection
- Residential construction
- Wall openings
- Other walking and working surfaces
Fall Protection Required

- Unprotected sides, edges

1926.501(b)(1)
Fall Protection Required

- Leading edges
Fall Protection Required

- Hoist areas

1926.501(b)(3)
Fall Protection Required

- Holes
  - Includes skylight floor openings

1926.501(b)(4)
Fall Protection Required

- Formwork and reinforcing steel

1926.501(b)(5)
Fall Protection Required

- Ramps, runways, other walkways

1926.501(b)(6)
Fall Protection Required

- Excavations

1926.501(b)(7)
Fall Protection Required

- Dangerous equipment

1926.501(b)(8)
Fall Protection Required

- Overhand bricklaying

1926.501(b)(9)
Fall Protection Required  1926.501(b)(10)-(11)

- Low-slope roof
  - \( \leq 4/12 \) pitch

- Steep roof
  - \( > 4/12 \) pitch
Fall Protection Required

- Pre-cast concrete erection

1926.501(b)(12)
Fall Protection Required

- Residential construction

1926.501(b)(13)
Fall Protection Required

- Wall openings
Fall Protection Required

- Other walking / working surfaces

1926.501(b)(15)
Fall Protection

Is this correct?
Falling Objects

- Each exposed employee shall wear a hardhat.

- Employer must take steps to prevent employees from being hit by falling objects.
  - Erect toe boards, screens, or guardrail systems
  - Erect a canopy structure
  - Barricade the area
Methods of Fall Protection 1926.502(a)(1)

- **Conventional methods**
  - Safety nets
  - Guardrails
  - Personal fall arrest systems (PFAS)
Guardrail System

- Smooth Surface
- 8 Feet
- No Projecting Ends

Dimensions:
- 42″ ± 3″
- 21″ ± 3″
- 3.5″
- ¼″
- 200 Pounds

Reference: 1926.502(b)
Guardrail System

Top rail: 42″+3″

Midrail: 21″+3″

Note: Toe boards are not part of a guardrail system for fall protection
Guardrails

Job well done
Personal Fall Arrest System

No slack
Personal Fall Arrest System

- Lots of slack!
- Only one attachment point!
Personal Fall Arrest System

Is this correct?
Personal Fall Arrest System 1926.502(d)

Anchorage

Connectors

Harness
Personal Fall Arrest System 1926.502(d)

- D-Rings, snaphooks, lanyards, lifelines, anchorages rated @ 5,000 pounds
- No free fall more than 6’, nor contact any lower level; 3.5’ max deceleration
- Provide for prompt rescue
- Inspect prior to each use
Personal Fall Arrest System

- 1’ Harness stretch
- 3’ Distance
- 6’ Lanyard
- 3.5’ Decel
- 5’ bet. D-ring and feet
Personal Fall Arrest System

- Body belts **not** allowed for fall arrest but may be used as a positioning device

- Only locking type of snaphook can be used
Positioning Device System

- Allows an employee to be supported on an elevated vertical surface
- No more than 2’ freefall
- Inspected before each use
- Safety belts okay for use
Methods of Fall Protection

Other acceptable methods

- Used under certain circumstances
  - Warning lines
  - Control access zones (CAZ)
  - Safety monitor
  - Fall protection plan

Sample Fall Protection Plans

The following Fall Protection Plan is a sample program prepared for the prevention of injuries associated with falls. A Fall Protection Plan must be developed and evaluated on a site by site basis. It is recommended that employers discuss the written Fall Protection Plan with their OSHA Area Office prior to going on a job site.

1. Statement of Company Policy

   (Company Name) is dedicated to the protection of its employees from on-the-job injuries. All employees of (Company Name) are responsible to work safely on the job. The purpose of this Plan is (a) To implement our standard safety policy by providing safety standards specifically designed to prevent fall protection on the job and (b) to ensure that each employee is trained and made aware of the safety procedures which are to be implemented on this Plan prior to the start of erection.

   The Fall Protection Plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as identifying specific activities that require non-conventional means of fall protection. These areas include:
   a. Connecting activity (point of erection)
   b. Leveling edge work
   c. Unprotected sides or edges
   d. Sorting

   This Plan is designed to enable employers and employees to recognize the fall hazards on the job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking or working surfaces. Each employee will be instructed to wear personal protective equipment to which he is exposed when working from heights. In the event that employees fail to comply with this requirement, this is the case, the employee is to notify the foreman of the concern and the concern addressed before proceeding.

   Safety policies and procedures on any one project cannot be administrated, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a decision, committed effort by every individual involved in the project from management down to the last employee. Each employee must understand that safety is important to the company, the safety of personnel, both monetary, physical, and emotional, the objectives of the safety program and procedures, the safety rules that apply to the safety policies and procedures, and what their responsibilities are in implementing, monitoring and compliance of their safety policies and procedures. This requires a more personal approach to consultation through sharing, understanding and cooperation, rather than by simple enforcement. For any reason an unsafe act persists, strict enforcement will be implemented.

   It is the responsibility of (name of competent person) to implement this Fall Protection Plan. (Name of Competent Person) is responsible for continuing observation of safety checks of the work operation and to enforce the safety policy and procedures. The foreman also is responsible to correct any unsafe acts or conditions immediately. It is the
Warning Lines

- Used on low-sloped roofs \( \leq 4/12 \)
- Erect 6’ from all edges
- Need fall protection for last 6’
- Used in combination with other systems
- Developed by competent person

1926.502(f), 1926.501(b)(10)
Controlled Access Zones

Used in:
- Leading edge work
- Overhand bricklaying
- Pre-cast concrete

Only authorized persons
Safety Monitor System

- Used on low-sloped roofs $\leq 4/12$
- With roof widths $\leq 50'$, can use alone
- Monitor must be competent person
  - No other responsibilities
Fall Protection Plan

- Only for specific area or jobs
  - Leading edge work
  - Precast concrete erection work
  - Residential construction work

- Used when conventional fall protection equipment is infeasible or creates a greater hazard

- Designed by qualified person

- Supervised by competent person
Covers for Holes

Covers shall:

- Withstand two times weight of expected load
- Secured to prevent displacement
- Marked “hole” or “cover” or color-coded
Protection from Falling Objects

Toeboards

- When used as falling object protection, shall be erected along the edge of the overhead walking/working surface
- Withstand force of at least 50 pounds
- Toeboards shall be a minimum of 3½ inches in vertical height
The employer shall:

- Provide training program
- Assure each employee has been trained
- Provide written certification
- Retrain where necessary
Now let’s test what you have learned...
Is this correct?
Personal Fall Arrest Systems

Is this correct?
Personal Fall Arrest Systems

Is this correct?
Personal Fall Arrest Systems

Is this correct?
Personal Fall Arrest Systems

Is this correct?
Covers

Is this correct?
Guardrails

Is this correct?
Guardrails

Is this correct?
Guardrails

Is this correct?
Summary

In this course, we discussed:

- Emphasis on fall protection
- Subpart M requirements
- Applying fall protection standards to construction sites
Thank You For Attending!

Final Questions?