

Jay Industries, Inc.

Fall Protection Safety Manual

Each year over 100,000 injuries and deaths are caused by work related falls. The Bureau of Labor Statistics shows that falls are one of the leading causes of occupational death. An OSHA study of 99 fall related fatalities shows that all of the deaths could have been prevented by the use of fall protection.

Employees must be protected from falling when working on a surface that has an unprotected side or edge which is 4 feet or more above an adjacent lower level or when working from aerial lifts or other elevated work platforms and lifts. All work performed from elevated surfaces including roofs, building ledges, mobile lifts, scaffolding, and other work platforms shall be in accordance with this Manual and Fall Protection Program.

Fall hazards must be evaluated to determine the best method to protect the employee. When considering what type of fall protection to use, the following list of remedies, in order of preference, should be considered:

- Elimination of the fall hazard by bringing the work down to safe ground level
- Use of passive fall protection systems such as guard rails
- Fall restraint which prevents a person from reaching a fall hazard
- Fall arrest which utilizes equipment to stop a fall after it occurs
- Administrative controls which use work practices or procedures to signal or warn a worker to avoid approaching a fall hazard.

This manual was developed to assist employers in providing a safe work environment for all employees. It is not intended to supersede any federal, state or local requirements or regulations. This manual, while written in adherence with OSHA regulations, should not be considered a substitute for any provision or standard of OSHA.

References

- 29 CFR 1926 Subpart M (Fall Protection in Construction)
- 20 CFR 1910 Subpart D (Walking-Working Surfaces – General Industry)
- 29 CFR 1910.269 (Electrical Power, Generation, Transmission)
- 29 CFR 1910.132 (Personal Protective Equipment – General Requirements)

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1. Objective

The objective of the Fall Protection Safety Program is to comply with the Occupational Safety and Health Administration's (OSHA) Fall Protection General Industry and Construction Standards. Our policy is to take a proactive approach in identifying fall hazards, selecting the proper fall protection and providing all necessary training for all affected employees.

This program applies to all work areas/operations where employees may be exposed to fall hazards. Copies of the Fall Protection Safety Program are available for review by all employees on the internal web, or by request of the EHS Department.

2. Background

OSHA mandates a uniform threshold height of 4 feet. This means that employees must be protected from fall hazards and falling objects whenever an affected employee is 4 feet or more above a lower level. Protection also must be provided for employees who are exposed to the hazard of falling into dangerous equipment.

3. Assignment of Responsibilities

- A. The EHS Department will manage the Fall Protection Safety Program, facilitate training, maintain all records pertaining to the plan, and review and update the plan as necessary.
- B. Management will ensure that each employee understands and follows the Fall Protection Safety Program through employee orientation, job hazard assessments, training, job performance reviews and disciplinary action. Management will also determine the need for fall protection and ensure its proper installation and inspection (Appendix B). All necessary information, equipment and personnel needed to comply with this program will be provided by the company.
- C. Supervisors are responsible for identifying any existing or potential fall hazards at the worksite or working conditions which are unsanitary, hazardous or dangerous to employees. Supervisors must identify and provide the necessary personal fall protection equipment required for working in fall hazard situations. Supervisors are responsible for identifying employees who require training prior to working at elevated heights. Employee training will be conducted by a Competent Person, as defined by OSHA:
 1. A person who is capable of identifying existing and predictable hazards in the surroundings or identifying working conditions which are hazardous or dangerous to employees, and
 2. A person who has authorization to take prompt corrective measures to eliminate them.

- D. Employees share the responsibility for using proper work practices and maintaining the provided fall protection equipment and systems in the correct manner. Employees are responsible for wearing the appropriate fall protection equipment when directed and for following the Fall Protection Manual. Employees are responsible for the proper care, use, and inspection of their assigned fall protection equipment. Employees shall report any unsafe conditions to their supervisor.

4. Job Hazard Assessment

Proper planning is the best tool for keeping employees safe on the job. A job hazard assessment should be conducted by the supervisor, and it is important to include affected supervisors and employees in the assessment.

The assessment should include, but not be limited to, the following elements:

- Evaluation of work areas.
- Evaluation of the job to be done.
- Identify employees who are exposed to fall hazards.
- Protection for employees from falling at heights of 4 feet above a lower level.

The assessment will provide information that will help:

- Identify fall hazards and potential fall hazards;
- Reduce or remove fall hazards or exposure to fall hazards from the work area.
- Determine the appropriate engineering controls, fall prevention and fall protection systems for the work areas; and
- Determine training needs.

Over time, the need for additional hazard assessments might be necessary.

5. General Requirements

A. Housekeeping

- a. All areas, passageways, storerooms and service rooms must be kept clean, orderly and in a sanitary condition.
- b. Floors must be maintained in a clean, dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats or other dry standing places should be provided where practicable.
- c. Floors, work areas, and passageways must be kept free from protruding nails, splinters, holes or loose boards.

B. Aisles and Passageways

- d. Where mechanical handling equipment is used, sufficient safe clearances must be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways must be kept clear and in good repair, with no obstruction or hazard across or in aisles.

- e. Permanent aisles and passageways shall be appropriately marked.

C. Covers and Guardrails

- f. Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.

D. Floor Loading Protection

- g. In every building, structure or part thereof that is used for business, industrial or storage purposes, the loads approved by the building official will be marked on signs and securely affixed in a conspicuous place in each space to which they relate. Such signs must not be removed or defaced.
- h. Employees, supervisors, subcontractors or others must not place, cause or permit to be placed on any floor or roof of a building or other structure a load greater than that for which such floor or roof is approved by the building official.

6. Fall Protection Situations

Fall protection must be provided for each employee on a walking/working surface with an unprotected side or edge at the height required by the OSHA standard applicable to their work place. In general industry the elevated height level is four feet (4) or more above a lower level. In the construction industry OSHA mandates employers to protect employees from fall hazards and falling objects whenever the employee is six feet (6) or more above a lower level. In some construction situations the height requirement for protection can be different. It is important to know which OSHA regulation is applicable to the work environment. The following areas require fall protection:

- Unprotected sides and edges
- Hoist areas
- Stairway floor openings
- Ladder-way floor openings
- Hatchway and chute floor openings
- Skylight floor openings
- Pit and trapdoor floor openings
- Manhole floor openings
- Temporary floor opening
- Floor Holes
- Wall openings
- Chute wall openings
- Window wall openings
- Temporary wall openings
- Open-sided floors, platforms, and runways
- Other
- The job hazard assessment will be the deciding factor in the need for and type of fall protection.

7. Fall Protection

- A. Fall protection will be provided with a standard railing. Specifications for the railing will be as follows:
- Consist of a top rail, mid rail and post.
 - Height from the upper surface of the top rail to floor level should be 42 inches.
 - Mid rail height is 21 inches.
 - The ends of the rails should not overhang the terminal posts.
- B. Toeboards must be provided whenever there is the risk of tools, machine parts or equipment falling to a lower level. Toeboards should be four (4) inches high, with not more than ¼ inch clearance above the floor.
- C. Regardless of height, open-sided floors, walkways, platforms and/or runways above or adjacent to dangerous equipment must be guarded with a standard railing and toeboard.
- D. All floor openings measuring 12 inches or more in its least dimension should be covered or guarded to prevent people from falling or stepping into the area and/or materials from falling into the area.
- E. Every floor hole should also be guarded by either standard railing with toeboard or cover of sufficient strength and construction.
- F. Other types of fall protection may be utilized depending upon the situation. Options include a safety net system, personal fall arrest system (PFAS), positioning system, travel restraint system and ladder safety system. See page 8 for information on a Personal Fall Arrest System.

8. Employee Training

Supervisors are responsible for the Fall Protection Safety Program and will ensure that all program elements and training are carried out and training provided to each affected employee. All affected employees will receive initial training on the Fall Protection Standard and this Manual before starting work. A Competent Person will conduct the training and it will include:

- Identifying fall hazards in the work area;
- Correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems used;
- Selection, proper use and care of equipment comprising a personal fall arrest system;
- The role of employees in the fall protection plan;
- Rescue procedures to follow in case of a fall?
- Overview of OSHA fall protection standards.

Circumstances where retraining is required include, but are not limited to, situations where:

- changes to the workplace render previous training obsolete; or
- changes in the types of fall protection systems or equipment to be used renders previous training obsolete; or
- when an employee's knowledge or use of fall protection systems or equipment indicates that the employee has not retained the required understanding or skill; or

- every two years.

9. Outside Contractors

All outside contractors will be required to follow this policy and utilize the appropriate fall protection measures as determined by the site supervisor. Outside contractors will be informed of these requirements during initial contract discussion.

10. Policy Evaluation

This fall protection safety program will be evaluated as determined by the EHS department to determine its effectiveness and need for change. Items to be reviewed for this purpose include but are not limited to:

- OSHA guidelines.
- Job Hazard Assessments.
- Training Records.
- Accident Reports.
- Changes in Equipment.

11. Fall Protection Systems

One of the following systems shall be in place whenever an employee is exposed to a fall hazard of four (4) feet or higher:

Guardrail systems

These are classified as a passive method of fall protection and are preferred method for eliminating fall hazards. Guardrails are needed at the edge of any work area 4 feet or more in height, to protect employees from falling. This includes the edge of excavations greater than six feet in depth. Guardrail systems must meet the following criteria:

Guardrail systems must meet the following criteria:

- Toprail – Must be located 42 inches, +/- 3 inches above the walking/working level. It must withstand a force of 200 pounds when applied in any downward or outward direction. The ends of the top rail should not overhand the terminal posts, except when such an overhang does not present a projection hazard.
- Midrail – Must be located midway between the top rail and the walking/working level. It must withstand a force of 150 pounds applied in any downward or outward direction.
- Toeboards are required for all guardrails on elevated walking or working platforms where employees working below are exposed to falling objects. Toeboards must be four inches in height and must be securely fastened.
- Both top and midrails should be constructed of materials at least one-quarter inch in thickness or diameter. If wire rope is used for top rails, it needs to be flagged with high-visibility material at least every 6 feet and can have no more than 3” of deflection.

- It is important to remember that the working level is the level where the work is being done. Someone working on a stepladder next to an edge may raise his/her working surface well above the walking surface.
- The system should be smooth to prevent punctures, lacerations or snagging of clothing
- When a hoisting area is needed, a chain, gate or removable guardrail section must be placed across the access opening when hoisting operations are not taking place.

Loading docks

Loading docks and other open sided floors greater than 4 feet above ground level must be protected. The approved method of protection is the installation of a standard guardrail as described above, which may have removable sections to provide access for loading but rails must be in place when access is not required.

Skylights

Skylights are considered an opening when present on a roof. A standard guardrail or skylight screen capable of supporting at least 200 pounds must be provide around the opening to prevent workers from falling through to the surface below.

Skylights constructed at least 42 inches above the roof deck with sides capable of supporting 200 pounds do not require additional protection.

Personal Fall Arrest System

There are three main components to the Personal Fall Arrest System:

1. Personal Protective Equipment worn by the employee;
2. Connecting devices;
3. Anchorage points

All personal fall arrest system components must meet the current ANSI Z359 Standard requirements. When choosing a PFAS, refer to the most recent ANSI and OSHA standards. The system must meet the following criteria on each component:

Personal Protective Equipment

- Full body harnesses are required. The use of body belts is prohibited.
- The attachment point of the body harness is the center D-ring on the back.
- Employees must always tie off at the D ring of the harness except when using lanyards 3 feet or less in length.
- Harnesses or lanyards that have been subjected to an impact load shall be destroyed.
- Load testing shall not be performed on fall protection equipment.

Connecting Devices

This device can be a rope or web lanyard, rope grab, or retractable lifeline.

- Only locking snap hooks may be used.
- Horizontal lifelines will be designed by a qualified person and installed in accordance with the design requirements.
- Lanyards and vertical lifelines need a minimum breaking strength of 5,000 pounds.
- The length of a single lanyard shall not exceed six feet.
- Steel lanyards are prohibited.
- Lanyards may not be clipped back to itself (such as around an anchor point and back) unless specifically designed to do so.
- If vertical lifelines are used, each employee will be attached to a separate lifeline.
- Lifelines need to be protected against being cut or abraded.

Anchorage

Secure anchor points are the most critical component when employees must use fall arrest equipment. There may be existing structures (like steel beams) that may meet the criteria for a secure anchor point). Sometimes locations may require the installation of a temporary or permanent anchor. As a minimum, the following criteria must be considered for each type of anchor point:

- Structure must be sound and capable of withstanding a 5000 lb. static load.
- Structure/anchor must be easily accessible to avoid fall hazards during hook up.
- Direct tying off around sharp edged structures can reduce breaking strength by 70% therefore; chafing pads or abrasion resistant straps must be used around sharp edged structures to prevent cutting action against safety lanyards or lifelines.
- Structures used as anchor points must be at the worker's shoulder level or higher to limit free fall to 6 feet or less and prevent contact with any lower level (except when using a self-retracting lifeline or 3 foot lanyard).
- Choose structures for anchor points that will prevent swing fall hazards. Potentially dangerous pendulum- like swing falls can result when a worker moves horizontally away from a fixed anchor point and falls. The arc of the swing produces as much energy as a vertical free fall and the hazard of swinging into an obstruction becomes a major factor. Raising the height of the anchor point can reduce the angle of the arc and the force of the swing. Horizontal lifelines can help maintain the attachment point overhead and limit the fall vertically. A qualified person must design a horizontal lifeline.

Permanent Anchor Requirements

In addition to all the criteria listed above, the following points must be considered:

- Environmental factors and dissimilarity of materials can degrade exposed anchors, so permanent anchors must be included in a Preventive Maintenance Program with scheduled annual re-certification.

- Insure that permanent anchors are compatible with employee's fall arrest equipment.
- Visible labels must mark the locations of permanent anchors.
- Roof anchors must be immediately removed from service and re-certified if subjected to fall arrest forces.

Reusable Temporary Anchors

- Reusable temporary roof anchors must be installed and used following the manufacturer's installation guidelines.
- Roof anchors must be compatible with employee's fall arrest equipment.
- Roof anchors must be removed from service at the completion of the job and inspected prior to reuse following the manufacturer's inspection guidelines.
- Roof anchors must be immediately removed from service and disposed of if subjected to fall arrest forces.

Complete System

- If a fall occurs, the employee should not be able to free fall more than 6 feet nor contact a lower level.
- To ensure this, add the height of the worker, the lanyard length and an elongation length of 5.5 feet. Using this formula, a six-foot worker would require a tie-off point at least 15.5 feet above the next lower level.
- A personal fall arrest system that was subjected to an impact needs to be removed from service immediately.
- Personal fall arrest systems need to be inspected prior to each use and damaged or deteriorated components removed from service.
- Personal fall arrest systems should not be attached to guardrails or hoists.

12. Work from Aerial Lifts and Self Powered Work Platforms

Training in the proper operation and inspection of the equipment must be received prior to operating or working from an aerial lift or self-powered work platform, regardless of the type.

Body harnesses must be worn with a shock-absorbing lanyard (preferably not to exceed 3 feet in length) and must be worn when working from an elevated work platform (exception: scissor lifts and telescoping lifts that can move only vertically do not require the use of a harness and lanyard as long as the work platform is protected by a guardrail system). The point of attachment must be the anchor point installed by the equipment manufacturer. Personnel cannot attach lanyards to adjacent poles, structures or equipment while they are working from the aerial lift.

Personnel cannot move an aerial lift while the boom is in an elevated working position and the operator is inside of the lift platform.

13. Rescue Plan

Any job requiring the use of personal fall protection equipment shall have two people assigned. One person to complete the task and one person to act as an observer to render assistance if required. A rescue plan should always be in place before entering the fall area. It is not suitable to say that the Fire Department is the rescue plan; employees must have a way to get a fallen employee safely and quickly to the ground.

14. Inspection

The employee shall inspect the entire personal fall arrest system prior to every use. The competent person will inspect the entire system in use at the initial installation and weekly thereafter. The visual inspection of a personal fall arrest system shall follow the manufacturer's recommendations. Any components of a personal fall arrest system noted to be damaged shall be removed from service immediately. An example of a complete inspection is in Appendix A.

Personal Fall Arrest System Inspection

Appendix A

Harness Inspection

Webbing

Inspect the entire surface of webbing for damage. Beginning at one end, bend the webbing in an inverted “U”. Holding the body side of the belt toward you, grasp the belt with your hands six to eight inches apart. This surface tension makes the damaged fibers or cuts easier to see. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage.

D Rings/Back Pads

Check D rings for distortion, cracks, breaks, and rough or sharp edges. The D ring should pivot freely. D ring back pads should also be inspected for damage.

Attachment of Buckles

Note any unusual wear, frayed or cut fiber, or distortion of the buckles.

Tongue/Grommet

The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. The webbing should not have any additional punched holes.

Tongue Buckle

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. The roller should turn freely on the frame. Check for distortion or sharp edges.

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 points of the center bar.

Lanyard Inspection Hardware

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.

Thimbles: The thimble must be firmly seated in the eye of the splice, and splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.

Web Lanyard

While bending the webbing over a curved surface such as a pipe, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Examine the webbing for swelling, discoloration, cracks, or burns. Observe closely for any breaks in the stitching.

Rope Lanyard

Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change from the original diameter. The rope diameter should be uniform throughout, following a short break-in period. Make sure the rope has no knots tied in it. Knots can reduce the strength of the rope by up to 60%.

Shock-absorbing Lanyard

Shock-absorbing lanyards should be examined as a web lanyard. However, also look for signs of deployment. If the lanyard shows signs of having been put under load (e.g. torn out stitching), remove it from service.

Self-Retracting Lanyard/Lifeline

- The lanyard housing must be inspected to ensure that casing bolts are tight and that there are no loose fasteners, missing parts, cracks or excessive wear or corrosion.
- Webbing must be inspected for cuts, nicks or tears as well as for any broken fibers, stitching or fraying.
- Steel lanyards should be inspected for cuts, fraying, broken wires and overall deterioration and excessive wear.
- Fittings are to be inspected for wear or cracks and obvious damage.
- Follow manufacturer's recommendations for additional inspection tasks and for any requirements that the unit be sent in to the manufacturer for periodic inspection.

Appendix B
Fall Protection Inspection Form

All types of fall protection must be identified and noted on this form. If additional space is needed use the back of this sheet.

| FALL PROTECTION SYSTEMS | | | | |
|-------------------------|-------|----------|-----------|----------|
| System | Used? | Location | Pass/Fail | Comments |
| Guardrails | | | | |
| Toeboards | | | | |
| Covers | | | | |
| Stairway railings | | | | |
| Safety Net | | | | |
| PFAS | | | | |
| Other: | | | | |