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FALL PROTECTION

All PFI Standards and Best Practices are advisory only. There is no agreement to adhere to any PFI Standard or Best Practice and their use by anyone is entirely voluntary.

PFI Fall Protection Best Practice

Management and Field supervision are responsible for continual observance of the work operations and to enforce the safety policy and procedures, correcting any unsafe acts or conditions immediately. It is the responsibility of the employee to inspect all components used for fall protection prior to use and daily thereafter. All components of the fall protection system shall meet the requirements of applicable ANSI, ASTM, or OSHA standards, and/or Department of Labour. Means for compliance shall fall into one or a combination of the categories found in this section.

GUARD RAIL SYSTEMS

Where feasible a guardrail system shall be erected to protect employees from a fall to a lower level. The following protective measures should be implemented for the protection of employees;

- Guardrails can withstand a force of at least 200 pounds applied within two inches of the top edge in any outward or downward direction.
- Guardrail must be surfaced in a way that will prevent punctures, lacerations and snags.
- When guardrails are used in hoisting areas, a chain, gate or removable guardrail section must be placed across opening when hoisting operations are not taking place.

Top Rail

- The top edge of guardrails must be between 39 inches and 45 inches high. The top edge of the guardrail must not deflect to less than 39 inches with 200 pounds of downward force.

Mid Rail

- Mid rails, screen, mesh or intermediate vertical members must be installed between the top edge of the guardrail and the walking/working surface when there is no wall or parapet wall at least 21 inches high.
- Mid rails, screens, mesh and intermediate vertical members can withstand a force of at least 150 pounds applied in any downward or outward direction at any point along the mid rail or other member.

Toe Board

- Toe board at least 3 ½ in. in height withstanding an outward force of 50 pounds should be in place where materials may fall to a lower level.

CONTROL ZONE SYSTEM

A controlled access zone means an area designated and clearly marked both on the plant floor in which work takes place overhead and at the access points to the bridge of

the crane (where applicable) and work areas that do not have perimeter guardrails. The control zone shall comply with the following provisions:

- When used to control access to areas where overhead work, roof work and other operations are taking place, the controlled zone shall be defined by a control line, danger tape, or by any other means that restricts access. In addition, signage for “Overhead Work” should demarcate areas below. In landing zones or material receiving areas at roof level, the employees must be equipped with harnesses and be tied off to an appropriate anchorage point.
- The control line shall extend along the entire length of the unprotected edge or area and shall be approximately parallel to the unprotected edge/area. They shall be erected not less than six (6) feet from the leading edge.
- The control line shall be connected on each side to a wall, column or supporting stanchions.
- The control lines shall not be removed from the floor and working areas until all tools, debris, equipment, etc. are removed from overhead equipment and trusses.
- The control lines shall consist of ropes, wires, or equivalent materials, and supporting stanchions as follows:
 - If working on a roof, demarcate the area below with “Danger Tape” to keep personnel out of the area. Place “Overhead Work” signs where needed to appropriately notify personnel of the work activity.
 - Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39-inches from the walking/working surface and its highest point is not more than 45-inches from the walking/working surface and be flagged with danger tape every 6 ft.
 - Each control line on the roof shall have a minimum breaking strength of 200 pounds.
 - A spotter (ground person) will be assigned to the Control Access Zone directly below the work on the roof.

PERSONAL FALL ARREST SYSTEM

Personal protective equipment shall include a full body harness, shock absorbing lanyard or self-retracting lifeline, appropriate anchorage point, and connectors. Additional protective measures are as follows;

- The anchorage points or structural member that the lanyard is attached to shall be capable of supporting a dead weight of not less than 5,000 pounds.
- The maximum free-fall distance allowed is six (6) feet. If the lanyard cannot be tied off at a point above the attachment point on the harness, a self retracting lifeline is to be used.

- Whenever possible, the employee should be tied off to a point above the shoulders to minimize potential fall distance. Shock absorber lanyard allows a free-fall distance of six (6) feet with an additional 30 to 40 inches as the employee's fall is slowed through the shock absorber. Thus, total potential length of the lanyard is approximately 9'1/2" feet.
- The employee shall inspect all parts of the fall arrest system before use each day. This may include: safety harnesses, lanyards, attachment devices, anchorage points, etc.
- The safety harness and lanyard shall be stored in a clean, dry area away from excess heat.
- If the harness or lanyards are exposed to freezing temperatures when wet, sources of flame, chemicals, are kinked, sharp corners, or show any other signs of wear; they should be removed from service and replaced.
- Cables and chokers used for fall protection shall be used exclusively for that use.
- Prior to working at heights, a plan for rescue should be devised. This may be accomplished by using an aerial lift or coordination through emergency response protocol.

TRAINING

It is important that employees can successfully recognize fall conditions, understand the importance of fall prevention and protection, properly utilize and maintain fall protection equipment, work safely near roof edges and openings, and safely access and egress from elevated areas. Employees shall be educated to recognize hazards associated with work at heights.

HARNESS INSPECTION

To inspect your harness, perform the following procedures.

- Webbing – Grasp the webbing with your hands 6 inches (152 mm) to 8 inches (203 mm) apart. Bend the webbing in an inverted “U”. The surface tension resulting makes damaged fibers or cuts easier to detect. Follow this procedure the entire length of the webbing, inspecting both sides of each strap. Look 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 – Inspect for any unusual wear, frayed or cut fibers, or broken stitching of the buckle or D-ring attachments.
- Tongue/Grommets – The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Webbing should not have additional punched holes.

- Tongue Buckles – 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. Roller should turn freely on 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 at the center bar.
- Quick-Connect Buckles – Inspect the buckle for distortion. The outer bars and center bars must be straight. Make sure dual-tab release mechanism is free of debris and engages properly.

LANYARD INSPECTION

When inspecting lanyards, begin at one end and work to the opposite end, slowly rotating the lanyard so that the entire circumference is checked. Additionally, follow the procedures below.

- 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 the splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion or cracks.
- Wire Rope Lanyard – While rotating the wire rope lanyard, watch for cuts, frayed areas, or unusual wearing patterns on the wire. Broken strands will separate from the body of the lanyard.
- Web Lanyard – While bending webbing over a pipe or mandrel, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks and charring are obvious signs of chemical or heat damage. Observe closely for any breaks in stitching.
- Rope Lanyard – Rotate the rope lanyard while inspecting from end-to-end for any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period.
- Shock Absorber Pack – The outer portion of the pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to D-rings, belts or lanyards should be examined for loose strands, rips and deterioration.
- Shock-Absorbing Lanyard – Shock- absorbing lanyards should be examined as a web lanyard (described in bullet 3 above). However, also look for the warning

flag or signs of deployment. If the flag has been activated, remove this shock-absorbing lanyard from service.

SELF-RETRACTING LIFELINE INSPECTION

- Check Housing – Before every use, inspect the unit’s housing for loose fasteners and bent, cracked, distorted, worn, malfunctioning or damaged parts.
- Lifeline – Test the lifeline retraction and tension by pulling out several feet of the lifeline and allow it to retract back into the unit. Always maintain a light tension on the lifeline as it retracts. The lifeline should pull out freely and retract all the way back into the unit. Do not use the unit if the lifeline does not retract. The lifeline must be checked regularly for signs of damage. Inspect for cuts, burns, corrosion, kinks, frays or worn areas. Inspect any sewing (web lifelines) for loose, broken or damaged stitching.
- Braking Mechanism – The braking mechanism must be tested by grasping the lifeline above the impact indicator and applying a sharp steady pull downward which will engage the brakes. There should be no slippage of the lifeline while the brakes are engaged, once tension is released, the brakes will disengage and the unit will return to the retractable mode. Do not use the unit if the brakes do not engage. Check the hardware as directed in the previous section, Lanyard Inspection — Hardware/Snaps. The snap hook load indicator is located in the swivel of the snap hook. The swivel eye will elongate and expose a red area when subjected to fall arresting forces. Do not use the unit if the load impact indicator has been activated.

CLEANING GEAR

Basic care of all safety equipment will prolong the durable life of the unit and will contribute toward the performance of its vital safety function. Proper storage and maintenance after use are as important as cleansing the equipment of dirt, corrosives or contaminants. Storage areas should be clean, dry and free of exposure to fumes or corrosive elements.

- Nylon or Polyester – Remove all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion; then wipe with a clean cloth.
- Housing – Periodically clean the unit using a damp cloth and mild detergent. Towel dry.
- Drying – Equipment should dry thoroughly without close exposure to heat, steam or long periods of sunlight.

Following a strict and systematic inspection and maintenance program for personal fall arrest systems may necessitate removing a harness or lanyard from service prior to the

expiration of its stated life expectancy guideline. When doing so the product should be disposed of in a manner that prevents inadvertent further use.

UNDERSTANDING FALL DISTANCE

