2014

MCW's Fall Prevention Program

This document is MCW's written program for managing fall hazards, and identifies roles and responsibilities for MCW employees, as well as contractors that may work at MCW on a periodic or ongoing basis.

Medical College of Wisconsin
Environmental Health and Safety Department
11/1/2014

SECTION

1. OBJECTIVE

A. The Fall Prevention Program is intended to clearly define procedures, equipment, and documentation to ensure protection of individuals engaged in outdoor or indoor work activities that expose them to potential falls from elevations.

B. The protection of the employees, contractors, property and environment is essential to the Medical College of Wisconsin (MCW), and this program is written to comply with OSHA's General Industry standards.
   - 29 CFR 1910 Subpart D and F of the Occupational Safety and Health Administration (OSHA) General Industry Standard.

C. Wisconsin Department of Safety and Professional Services defers to regulations to the OSHA standards listed.

2. SCOPE

A. The Fall Prevention Program applies to all MCW employees, students, contract/temp employees, outside contractors, subcontractors, visitors and vendors.

B. Any situation where a person could fall more than four (4) feet (OSHA General Industry standard) must be treated as a fall prevention location.
   1. Interior and exterior cleaning of windows, walls, ceiling, fixtures, or any other structure or equipment
   2. Interior and exterior painting, drywall work, ceiling, siding, or wall repair, window caulking
   3. Any task performed near skylights
   4. Any task involving a scaffold, ladder, or lift
   5. Tree trimming
   6. Any task conducted near the surface level of excavation work
   7. Any task performed at the edge of a hoist area, loading dock, platform, or mezzanine

C. Any situation where work is performed at any height (even less than 4 feet) over dangerous equipment such as conveyor belts, moving machinery, vats, chemicals, mixers, etc. must be treated as a fall prevention location.

D. Only authorized personnel who have been trained on the procedures and equipment covered within this program shall be permitted to perform any work activity involving applicable conditions of the program.

E. Any workers contracted through off-campus employers who are scheduled to perform work involving possible fall protection required tasks must either show proof of current training by their employer or attend training according to the MCW Fall Prevention Program.
   1. Any fall protection program training furnished by outside contractors must at least meet the procedures as described in this Fall Prevention Program.
   2. No work may be performed by outside contractors until such proof is documented with EH&S.

F. It must be noted that OSHA also regulates construction sites through a different standard, which will not be addressed in this document. However, affected employees should be made aware that other standards exist if other procedures are witnessed during construction projects.
   - 29 CFR 1926 Subpart E, L, M, and X of the OSHA Construction Industry Standard.

3. ROLES AND RESPONSIBILITIES

A. Senior Management shall require regulatory compliance and shall support the Fall Prevention Program by ensuring necessary resources are allocated for the program.

B. The Environmental Health & Safety department supports the program by:
   1. Developing and maintaining the various written components comprising the Fall Protection Program.
   2. Coordinating the implementation of the Fall Prevention Program into the daily operations of MCW
   3. Providing training resources to all affected employees and/or supervisors.
   4. Maintaining relevant training records.
   5. Approving all Fall Protection training materials, instructors, and internal and external auditors.
   6. Conducting annual audits of the written portions of the program.
   7. Maintaining audit records for a minimum of three years.
   8. Maintaining any records of accidents, near-misses, or other incidents involving the Fall Protection Program.
   9. Enforcing the Fall Prevention Program requirements.

C. Department Supervisors will support the Fall Prevention Safety Program by:
   1. Ensuring MCW employees perform work activities within compliance of the Fall Prevention Program.
   2. Providing necessary resources to their employees support the activities of the Fall Prevention Program.
   3. Ensuring that all affected department personnel attend required training.
   4. Ensuring that employees properly inspect and wear all required fall protection equipment.
   5. Reporting any accident, near-miss, or other incident to the Environmental, Health and Safety department.
   6. Communicating to the appropriate individuals all pertinent fall prevention safety information (e.g. scheduled training, product recalls, product notices, and safety bulletins).
   7. Ensuring that all fall protection equipment inspections are properly conducted (annual, every use, etc.).
   8. Maintaining inspection records for review. (Refer to Appendices A-E)

D. Employees of MCW will comply with the Fall Prevention Program by:
   1. Attending all applicable training. If a written exam is given the employee must pass with a minimum of 70%.
   2. Recognizing and reporting all unsafe fall protection hazards, accidents, and near-misses to their supervisors.
   3. Performing all work activities within compliance of the Fall Prevention Program.
   4. Wearing and inspecting all prescribed fall protection equipment as required by the Fall Prevention Program.
E. Contractors must supply MCW with proof of training for all affected on-site workers, submit equivalent forms, and otherwise abide by this plan or industry equivalent to ensure a safe work site.
F. The following tasks must be assigned by each institution to the appropriate job description/position:
   1. Ensure projects implemented on campus are in compliance with this program.
   2. Communicate to the appropriate individuals all pertinent fall protection information.
   3. Ensuring that all roofs are secure from unauthorized persons.

4. PROGRAM MATERIALS

A. All program materials shall be maintained so as to be available for review by EHS, employees, administration, and both internal and external auditors.
B. All employees of MCW have the right to review program materials upon request.
C. The Fall Prevention Program written program is maintained by EHS and is kept in the EHS Offices in M0820, as well as being available on the EHS Infoscope Website.
D. Training records are maintained by EHS and are kept on the MCW Server.
E. Program audit documentation is maintained by EH&S and is kept on the MCW Server.
F. Equipment inspections records are maintained by department supervisors and are kept either on the department hard drive or in a folder maintained in the department office area.
G. OSHA standard references and links are included where applicable.
   1. Links will take the reader to a general section in the regulations; some scrolling may be required to locate the exact letter and number in question.
   2. Links should be reviewed periodically to ensure activity.

5. COMPLIANCE

A. Every MCW employee is expected to conduct their work following all applicable safety and environmental codes and regulations as a condition of their employment.
B. Employees are expected to attend all relevant training applying to this program.
C. Department Supervisors or Managers shall be held responsible to ensure their reporting employees both follow these procedures and attend training.
D. Failure to comply with the procedures set forth in this program may result in disciplinary action according to the MCW Employee Handbook (or title equivalent).
E. Willful or repeated disregard for safe practices which results in serious injury to oneself or others, or significant property damage may be grounds for termination.

6. DEFINITIONS AND ABBREVIATIONS

Anchorage: a secure point of attachment for lifelines, lanyards or deceleration devices.

Anchor Point: a secure point of attachment for lifelines, lanyards or deceleration devices. An anchor point must be capable of supporting at least 5,000 pounds (3,600 pounds if engineered/ certified by a qualified person) per person and must be independent of any anchorage being used to support or suspend platforms.

Anchorages to which personal fall arrest equipment is attached shall be capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two, under the supervision of a qualified person.

Boatswain's Chair: a device is used to suspend a person from a rope in a chair in order to perform work aloft.

Body Belt: a device worn only around the waist with means for attaching it to other components of a personal fall restraint system. Body belts concentrate fall forces completely on the victim's midsection, causing potentially fatal injury. OSHA no longer allows the use of body belts as part of a fall arrest systems as of 12/31/1997. While the use of body belts is technically allowed for fall *restraint*, it is recommended to use only full body harnesses to avoid potential confusion or misuse in fall arrest situations.

Body harness: straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent person: someone who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Connector: a device which is used to couple (connect) parts of the personal fall arrest system and positioning device system together. It may be an independent component of the system, such as a carabineer, or it may be an integral component or part of the system.

Construction work: work for construction, alteration, and/or repair, including painting and decorating.

Controlled access zone (CAZ): an area in which certain work (e.g., overhand bricklaying) may take place without the use of a guardrail system, personal fall arrest system, or safety net system and access to the zone is controlled.

Deceleration device: any mechanism with a maximum length of 3.5 feet, such as a rope grab, ripstitch lanyard, tearing or deforming lanyard, self-retracting lifeline, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limits the energy imposed on an employee during fall arrest.

Designated area: a space which has a perimeter barrier erected to warn employees when they approach an unprotected side or edge, and serves also to designate an area where work may be performed without additional fall protection.

DSPS: Wisconsin Department of Safety and Professional Services; the Wisconsin state agency equivalent of OSHA.

EH&S: Environmental, Health and Safety; the department of the institution that manages environmental, health, and safety regulations and acts as a liaison between the institution and government regulatory agencies.

Energy shock absorber: a device that limits shock-load forces on the body.

Fall arrest system: a system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook. NOTE: body belts as part of a fall arrest system are disallowed by OSHA as of 12/31/1997.
Specifications:

- Limit maximum arresting force on an employee to 1,800 pounds (8 kN) when used with a body harness;
- (iii) Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and
- (iv) Shall have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of six feet (1.8 m), or the free fall distance permitted by the system, whichever is less.
- (2)(i) When used by employees having a combined person and tool weight of less than 310 pounds (140 kg), personal fall arrest systems which meet the criteria and protocols contained in paragraphs (b), (c) and (d) in section II of this appendix shall be considered as complying with the provisions of paragraphs (d)(1)(i) through (d)(1)(iv) above.
- (ii) When used by employees having a combined tool and body weight of 310 pounds (140 kg) or more, personal fall arrest systems which meet the criteria and protocols contained in paragraphs (b), (c) and (d) in section II may be considered as complying with the provisions of paragraphs (d)(1)(i) through (d)(1)(iv) provided that the criteria and protocols are modified appropriately to provide proper protection for such heavier weights.

Fall or fall hazard: the act or circumstances that could result in the possibility of slipping or tripping on or falling off a surface.

Free fall: the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall distance: the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hole: a gap or void 2 inches or more in its least dimension in a floor, roof, or other walking/working surface.

Lanyard: a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
Specifications for Lanyards and Lifelines:

- Lanyards and vertical lifelines which tie-off one employee shall have a minimum breaking strength of 5,000 pounds
- Self-retracting lifelines and lanyards which automatically limit free fall distance to two feet (0.61 m) or less shall have components capable of sustaining a minimum static tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- (5) Self-retracting lifelines and lanyards which do not limit free fall distance to two feet (0.61 m) or less, ripstitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Leading edge: the edge of a floor roof, or formwork for a floor or other walking/working surface which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline: a component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage. Specifications for Lifelines are included under *Lanyard*.

Low-slope roof: a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

Maintenance activity: making or keeping a structure, fixture or foundation (substrates) in proper condition in a routine, scheduled, or anticipated fashion. This definition implies "keeping equipment working in its existing state" i.e. preventing its failure or decline.

Opening: a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

OSHA: Occupational Safety and Health Administration; federal department that regulates workplace safety and health.

Overhand bricklaying and related work: the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Personal fall arrest system: a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these. As of January 1, 1998 the use of a body belt in a fall arrest system is prohibited.

Positioning device system: a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Qualified person: someone who, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

Restraint (tether) line: a line from an anchorage, or between anchorages, to which the employee is secured in such a way as to prevent the employee from walking or falling off an elevated work surface.

Retractable lifeline: a fall arrest device that allows free travel without slack rope, but locks instantly when a fall begins.

Rope grab: a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety-monitoring system: a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Scaffold: any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage) used for supporting employees, materials or both.

Skylight screens: a screen or grill that is capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen or grill. The screen or grill shall also be of such construction and mounting that under ordinary loads or impacts it will not deflect downward sufficiently to break the glass below them. The openings of screen or grill must not be more than 4 inches and the slat openings not more than 2 inches wide.

Self-retracting lifeline/lanyard: a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snaphook: a connector comprised of a locking type hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. NOTE: only locking type snaphooks are allowed as of 1/1/1998 (OSHA).
Specifications for snaphooks and D-Rings:

- Must be capable of maintaining a minimum tensile load of 5,000 lbs.
- Must be proof tested to a minimum tensile load of 3,600 lbs. without cracking, breaking, or taking permanent deformation.
- Must be sized to be compatible with the member to which they are connected so as to prevent unintentional disengagement of the snap-hook by depression of the snap-hook keeper by the connected member, or shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snaphook keeper by the connected member.

Steep roof: a roof having a slope greater than 4 in 12 (vertical to horizontal). A roof with a slope greater than 19.5 degrees

Toeboard: a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Total Fall Distance: the maximum vertical change in distance from the bottom of an individual's feet at the onset of a fall, to the position of the feet after the fall is arrested. This includes the free-fall distance and the deceleration distance.

Unprotected sides and edges: any side or edge of a surface, except at entrances to points of access, where there is no wall or guardrail system.

Walking/Working surface: any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system: a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, harness, or safety net system to protect employees in the area.

Work area: that portion of a walking/working surface where job duties are being performed.

7. WORKPLACE ASSESSMENT

A. Any workplace where elevated heights are accessed, or work that has the potential for falls must be assessed before any work begins. Such assessment will determine the type of fall protection system(s), and under what conditions, the fall protection must be employed.
   1. There are six types of fall protection systems which either prevent or restrain an employee from falling when working at elevated heights.
   2. The following fall protection systems have a wide range of application and satisfy protection requirements for most tasks that expose employees to fall hazards:
      a. Guardrail system

b. Fall-arrest system
c. Safety net system

3. The following fall protection systems have more specialized application:
   a. Positioning device system
   b. Distance Protection/ Warning line system
   c. Safety monitoring system

B. The first (and best) option in the workplace assessment is to determine if the fall hazard can be eliminated by removing the need for work to be performed on roofs or using ladders, via:
   1. Use of (telescoping) poles for painting, window cleaning, changing light bulbs, or other tasks.
   2. Relocation of valves, gauges, switches, levers, or other equipment to ground or floor level.

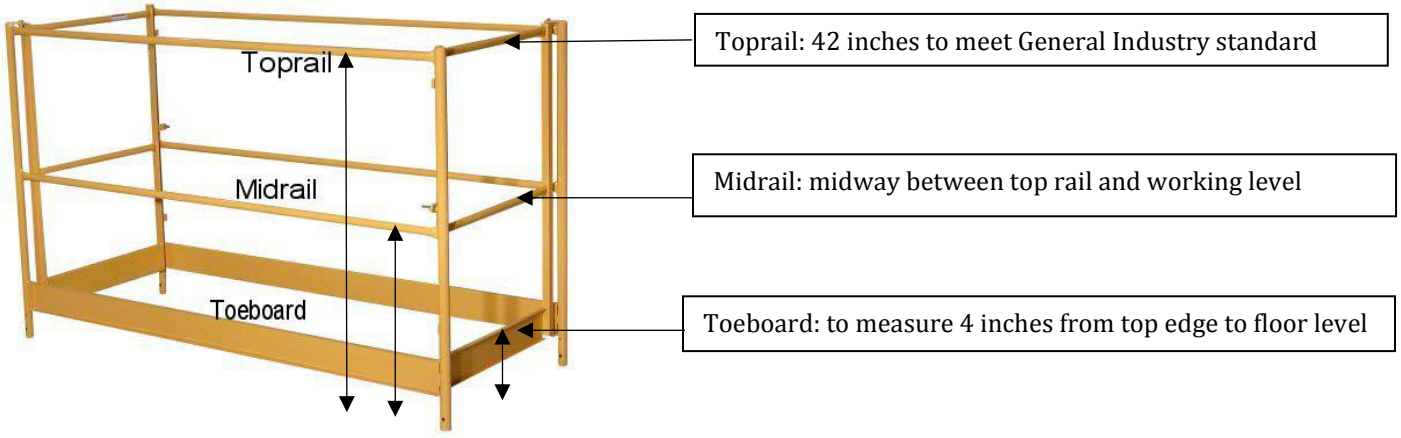
C. If the fall hazard cannot be eliminated, the Fall Prevention Hazard Assessment Form (Appendix F) must be completed and approved by Environmental Health and Safety or their designee.

D. The Fall Prevention Hazard Assessment Form will be required for all activities being conducted at 4 feet or more in height.

8. FALL PREVENTION METHODS

OSHA 29 CFR1910.23.e
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9715

A. Guard Rail System
   1. The first option typically used to protect workers from falls is a guardrail system.
   2. When utilized, a guardrail system shall meet the following criteria (refer to diagram below):



   3. Toprail specifications:
      a. Must be 42 inches (General Industry) above the walking/ working level.
      b. Must be capable of withstanding a force of at least 200 pounds (applied within 2 inches of the top edge in any outward or downward direction).
      c. Must be inspected as frequently as necessary to ensure strength and stability.
      d. Must protect workers from punctures or lacerations and made to prevent clothing from snagging.
   4. Midrail Specifications:
      a. Must be installed at a height midway between the top edge of the guardrail system and the walking/ working level.
      b. Must be capable of withstanding a force of at least 150 pounds (applied in any downward or outward direction).
   5. Toeboard Specifications:
      a. Are always required in General Industry.
      b. Shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp.
      c. Shall be capable of withstanding, without failure, a force of at least 50 pounds applied in any downward or outward direction at any point along the toe board.
      d. Shall be securely fastened in place and with not more than 1/4-inch clearance above floor level.
      e. Where tools, equipment, or materials are piled higher than the top edge of a toe board, paneling or screening shall be erected from the walking/working surface or toe board to the top of a guardrail system's top rail or mid rail, for a distance sufficient to protect employees below.
   6. Stair railings must be of similar construction as standard railing with this specification:

• The vertical height shall be not more than 34 inches nor less than 30 inches from the upper surface of the Toprail to the surface of the tread in line with face of riser at forward edge of tread.

B. Distance Protection
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=24998
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=24682
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10757&p_table=STANDARDS

Each of these links refers to Construction Industry standards (29 CFR 1926.501 in particular). Distance Protection is only permitted in the Construction Industry standards, and even then, only in very specific and defined situations:

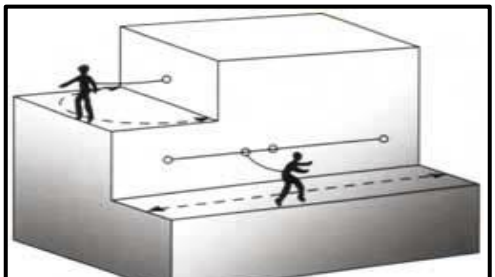
- Roofing work on low-slope roofs
- Leading edge work
- Precast concrete erection
- Residential construction

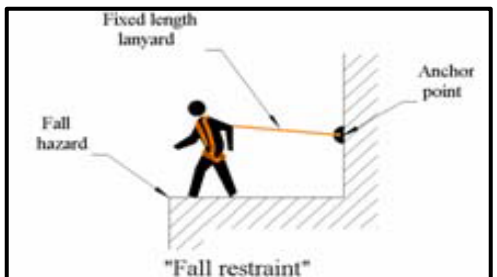
1. Distance protection should only be used as a final option to protect workers from falls. This method uses physical distance; that is, how close employees may be allowed to work near unprotected sides and edges.
2. Distance Protection must meet all of the following criteria:
   a. The area where the employee is working shall be at least 15 feet back from the unprotected sides and edges.
   b. The work must be of a temporary nature, such as maintenance on roof top equipment.
   c. The working surface must be free of snow, ice, or other materials and have a surface that does not pose a slipping hazard.
   d. Designated surface areas must fit the definition of "low slope" (refer to Section 6).
   e. The designated work area shall consist of an area completely surrounded by a rope, wire or chain and supporting stanchions erected in accordance with criteria defined below.
      1. Strength criteria:
         • Stanchions shall be capable of resisting, without tipping over, a force of at least16 pounds applied horizontally against the stanchion in the direction of the unprotected side or edge.
         • Rope, wire or chain shall have a minimum breaking or tensile strength of 500 pounds, and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.
         • Rope, wire or chain shall be attached at each stanchion in such a way that pulling on one section of the line will not result in slack being taken up in adjacent sections before the stanchion tips over.
      2. Height criteria: Rope, wire or chain shall be installed in such a manner that its lowest point (including sag) is no less than 34 inches and no more than 39 inches from the work surface.
      3. Visibility criteria: Rope, wire or chain forming the designated area shall be clearly visible from any unobstructed location.
      4. Location criteria: Stanchions shall be erected as close to the work area as is permitted by the task.
3. Access to the designated area shall have a clear path, formed by two lines, attached to stanchions, which meet the strength, height and visibility requirements of this paragraph.
4. No provisions need to be made for rescue.

9. PERSONAL RESTRAINT and FALL ARREST SYSTEMS

29 CFR 1910.66 Appendix C
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9730

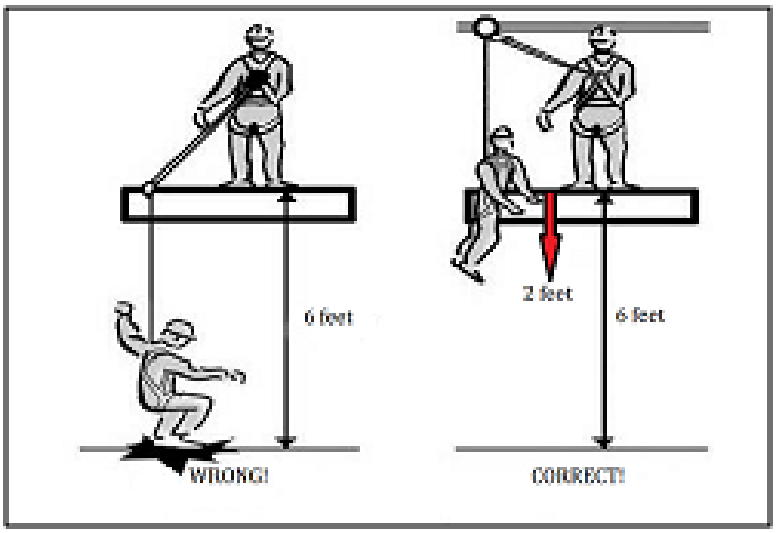
A. Restraint System
1. If a Guard Rail system is impractical to be used, the next option is to use a Restraint System.
2. A restraint system is rigged to allow workers to move only as far as the sides of the work area and prevents the wearer from reaching a fall hazard.
3. A restraint is made up of a full-body harness, lanyard, cable or rope with a rope grab at a predetermined length, which is connected to the anchorage and the user, and is shorter than the distance to the unprotected edge. The system allows the employee walk around and be able to reach the edge but will not let the employee fall off the edge. (Refer to diagram below)





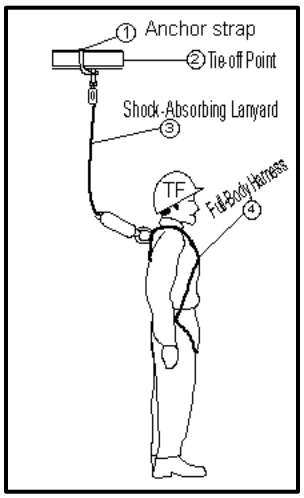
4. When utilized, a Restraint System must meet all of the following criteria:
   a. All users must be fully trained prior to using a restraint system.
   b. The system must be visually inspected by the user prior to operation.
   c. The system must physically prevent the user from reaching an unprotected edge and/or fall from or through the structure. (Refer to diagram above)
   d. Protection shall be rigged to allow the movement of employees only as far as the sides of the working level or working area.
   e. Basic specifications for snaphooks, D-rings, and lifelines may be found in Section 6, Definitions. For a complete overview, refer to the 29 CFR 1910.66 Appendix C link above.
   f. The anchor point must have an ultimate load capacity in any direction in which a load may be applied of at least 800 lb. or a structure that cannot be moved or pulled over by the employee.
   g. The anchorage point for the lanyard may be placed at foot level, provided there is no likelihood of damage to the equipment.
   h. Lanyards or rope grab shall be secured to a substantial member of the structure.
   i. A restraint line is not necessarily designed to withstand forces resulting from a fall therefore the rope or cable does not have to be (5000 lb.) rated.
   j. A rescue plan is not needed for a Restraint System.

B. Positioning System
   1. If a restraint system cannot be used, the next option is to use a Positioning System to protect workers from falls.
   2. A positioning system is made up of an anchorage point, energy shock absorber, and full-body harness.
   3. The system must be rigged such that an employee cannot free fall more than 2 feet. (Refer to the diagram below)



   4. When utilized, a positioning system must meet all of the following criteria:
      a. All Employees must be fully trained prior to using a restraint system.
      b. The system must be visually inspected by the user prior to each operation.
      c. The system may only be used in a vertical position.
      d. A written, approved provision for rescue of the user must be made prior to use. (Refer to Appendix G)
      e. Anchorages used to attach the positioning devices shall be capable of supporting at least 3,000 pounds per person attached.
      f. Connecting assemblies shall have a minimum tensile strength of 5,000 pounds.
      g. Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (0.6 m).
      h. The fixed anchorage shall be rigid, when force is applied.
      i. A single double locking lanyard shall have one end attached to a fixed anchorage and the other end connected to a body.
      j. A double locking lanyard shall be used to maintain a 100% tie-off when moving.
      k. A retractable lifeline may be considered when working on roofs and scaffolds, or in tanks, towers, vessels, and manholes. The retractable lifelines must automatically limit free fall distance to 2 feet.

C. Personal Fall Arrest System
   1. When fall hazards cannot be eliminated through any other means and a guardrail or restraint positioning device is not feasible, a Personal Fall Arrest System is the final option used to control falls.
   2. A Personal Fall Arrest System consists of: an anchor strap (1), anchorage/ tie-off point (2), double- locking lanyard, energy shock absorber (3), and full-body harness (4). (Refer to the diagram below)



   3. Personal Fall Arrest Systems must meet all of the following criteria:
      a. All users must be fully trained prior to operation.
      b. The system must be visually inspected by the user prior to each operation for wear, damage or other deterioration.
      c. Any defective component must immediately be removed from service.
      d. All components must be inspected every 6 months by a competent person.
      e. The system must be rigged so that employees can neither free fall more than 6 feet or contact any lower level below.
      f. A written, approved provision for rescue of the user must be made prior to use. (Refer to Appendix G)
      g. Anchorage devices used to attach a personal fall arrest system shall be capable of supporting at least 5,000 pounds per person attached.
      h. If Anchorages are installed they shall be designed under the supervision of a qualified person. Please refer to Section 6 for the definition of "qualified person".

10. FALL PREVENTION ASSESSMENT PLAN

A. In some cases, hazards may be managed by a Fall Prevention Hazard Assessment Plan (administrative controls) that rely on special training and work plans. These plans may be used for leading edge work or precast concrete work only if conventional fall protection equipment cannot be used or creates a greater hazard.
B. The Fall Prevention Assessment Plan must meet the following requirements:
   1. Be prepared by a qualified person and developed specifically for the site where the work is being performed using the Fall Prevention Hazard Assessment Checklist. (Appendix F)
   2. Explain why the use of conventional fall protection systems, such as guardrail systems and personal fall arrest systems, restraint systems, positioning systems and/or fall-arrest systems are infeasible or why the use would create a greater hazard.
   3. Explain the measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the conventional fall protection system. For example, the extent to which scaffolds, ladders or vehicle-mounted work platforms can be used to provide a safer working surface and reduce the hazard of falling.
   4. Identify each location where conventional fall protection methods cannot be used. These locations must be classified as Controlled Access Zones.
   5. Maintain up-to-date records with any changes approved by a qualified person.
   6. A copy of the Fall Prevention Hazard Assessment Plan (Appendix F) with all approved changes must be available at the jobsite.
   7. The plan shall be reviewed and signed by the "competent person"
   8. Once the Fall Prevention Hazard Assessment Checklist (Appendix F) is completed, the form will need to be approved by Environmental Health and Safety or their designee before work starts.

11. FALL PROTECTION EQUIPMENT

29 CFR 1910.66 Appendix C
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9730

A. Retractable Lifelines
   1. A Retractable Lifeline is a fall arrest device used in conjunction with other components of a Fall Arrest System.
   2. Retractable Lifelines may be used by only one person at a time.
   3. Retractable Lifelines must be properly inspected and maintained. (Appendix E)
   4. Retractable lifelines must be installed properly to automatically stop a person's descent in a short distance after the onset of an accidental fall.
   5. If the limit free fall distance is 2 feet or less, the lifeline anchor point shall be capable of sustaining a minimum tensile load of 3,000 pounds.
   6. If the free fall distance is more than 2 feet, than the lifeline anchor point shall be capable of sustaining a minimum tensile load of 5,000 pounds.

B. D-rings and Snaphooks
   1. D-rings and snaphooks must have a minimum tensile strength of 5,000 pounds.
   2. D-rings and snaphooks shall be double locking.
   3. D-rings and snaphooks must be properly inspected and maintained (Appendix C)
   4. Unless specifically designed for the following connections, snaphooks must not be connected:
      a. directly to webbing, rope, or wire rope
      b. to each other
      c. to a D-ring to which another snap hook or other connecter is attached
      d. to a horizontal lifeline
      e. to any object incompatible in shape or dimension relative to the snaphook, thereby causing the connected object to depress the snap hook keeper and release unintentionally

C. Anchorage Points:
   1. Anchorage points shall be designed and installed under the supervision of a qualified person.
   2. Anchorage points used to attach restraint systems shall be capable of supporting at least 800 pounds per person attached.
   3. Anchorage points used to attach a positioning system shall be capable of supporting at least 3,000 pounds.
   4. Anchorage points used to attach personal fall arrest systems shall be capable of supporting at least 5,000 pounds per person attached.
   5. Permanent Anchorage points shall be labeled as to their design capacity.
   6. Anchorage points must be properly inspected and maintained per manufactured recommendation. (Appendix D)

D. Boatswain's Chair
   1. A Boatswain's Chair is a device used to suspend a person from a rope in a chair in order to perform work aloft (see illustrations below).

   2. Employees must be properly trained with all equipment and procedures before using a Boatswain's Chair.
   3. The use of a full body harness must also be used and connected independent of the boatswain's chair device, and its support system, so that any failure of the boatswain's chair, support line, or anchorage system will not affect the ability of the fall arrest system to operate and quickly stop the fall.
   4. The personal fall arrest system must be independently attached to an anchorage point separate from that being used to support or suspend the boatswain's chair.
   5. The equipment must be inspected each day before use with emphasis on providing tiebacks when counterweights, cornice hooks, or similar non- permanent anchorage systems are used.
   6. All lines installed (such as by using knots, swages or eye splices) when rigging descent control devices shall be capable of sustaining a minimal tensile load of 5,000 pounds.

7. Provisions must be made for rescue. (Refer to Appendix G)
8. Ropes must be effectively padded where they contact edges of the building, anchorage, obstructions or other surfaces which might cut or weaken the rope.
9. When suspension heights exceed 130 feet and where rigging must be suspended by hand, mechanical means shall be provided for raising and lowering lines (wire rope, fiber and cable) when the entire line's weight exceeds 55 pounds.

12. MOBILE EQUIPMENT

29 CFR 1910.68

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9733

A. Articulated boom lift
1. This type of lift consists of a number of jointed sections which can be controlled to extend the lift in a number of different directions, which can often include 'up and over' applications. (refer to picture below)
2. All employees must be fully trained on both fall protection methods and lift operation before using the equipment.
3. All control labels and warning stickers in or on the lift must be legible.
4. All gates or chains must be closed or latched, and secured, while the lift is being used.
5. A full body harness must be worn by all occupants and attached to a proper anchor point on the lift basket when operating the lift at any height.
6. If any occupant exits the lift basket at any height, the person must immediately connect his fall protection rig to a separate rated anchor point that is suitable for the area where he is now working.

Articulated Boom Lift

B. Scissors Lift
1. A Scissors lift consists of a mechanical platform which only moves in a vertical plane, that is, straight up and down. (refer to picture below)
2. All controls and warning stickers in or on the lift must be legible.
3. A full body harness must be worn by all occupants of the Scissors Lift only if work requires the occupant to exit the confines of the guarded platform.
4. All employees must be fully trained on both Fall Protection methods and lift operation before using the equipment.
5. All gates or chains must be closed or latched, and secured, while lift is being used.
6. No occupant is allowed to stand on the basket rails for any reason; feet must remain on the floor!
7. Ladders are not permitted on the scissor lift platform to extend reachable height.

Scissors Lift

13. SCAFFOLDS AND LADDERS

CFR 1910.28
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9720

A. Scaffolds
   1. Guardrails or a fall-protection system at 6 feet will be required at all times while erecting and dismantling scaffolding unless the competent person can prove that fall protection is infeasible.
   2. Once erected, scaffolding 6 feet or more in height that employees are working on shall be required to have a guardrail or a fall-protection system.
   3. The manufacturer's guidelines pertaining to guardrail or a fall-protection systems may vary, and may require fall protection at lower heights.
   4. Where tools, equipment, or materials are piled higher than the top edge of a toe board, paneling or screening shall be erected from the walking/working surface to the top of the guardrail system's top rail, or mid rail, to protect employees below.
   5. The scaffold must be properly inspected before any access is allowed by a trained, competent person at the beginning of each shift and if the scaffold configuration or integrity is changed.
   6. Inspection tags (refer to Appendix H) must be hanging and plainly visible at the scaffolding access.
   7. If scaffold is used as a fall protection catch platform, the following criteria must be met:
      a. The platform must be placed in such a manner that the employee cannot fall more than 6 feet (construction) 4 feet (general industry) to the scaffold platform.
      b. Netting and a guardrail system shall be used on the scaffold platform.
      c. The platform shall be completely planked.
      d. All employees must be trained before accessing scaffold.

B. Ladders: General Requirements for All Ladders
   1. All ladders must be clearly identified with the type and weight capacity of the ladder.
      a. Type I-A 300 pounds: Extra Heavy Duty
      b. Type I 250 pounds: Heavy Duty
      c. Type II 225 pounds: Medium Duty
      d. Type III 200 pounds: Light duty
      e. Generally, Type III Light Duty ladders should not be used in a commercial or industrial workplace, as their load rating is insufficient for most tasks.
   2. Ladders must be inspected before each use and must include the following criteria:
      a. The joint between the steps and side rails must be tight; steps cannot wobble or rotate
      b. All hardware and fittings must be securely attached
      c. Movable parts must operate freely without binding or undue play.
      d. The feet of the ladder must be in good condition to prevent slip-out.
   3. Ladders with defects must be removed from service and tagged or marked as "Do Not Use".
      a. Report any defective ladder to your supervisor and maintenance department.
      b. If the ladder cannot be repaired the ladder must be destroyed and disposed of.
   4. Ladders may not be used to gain access to a roof or platform unless the top of the ladder extends at least 3 feet above the point of support, at eave, gutter, or roofline.
   5. When climbing, always use the "3-Point Rule": at least two hands and one foot, or two feet and one hand, must be in contact with the ladder at all times.
   6. Employees must not lean outside of the ladder rails. If the center line of the body (belt buckle) cannot be maintained between the ladder rails while working, a personal fall arrest system will be required.

C. Stepladders
   1. Definition: an A-shaped, self-supporting ladder which has two sets of hinged supports that meet at the top and are held together by collapsible hinges.
   2. Workers may not stand on top two steps of a stepladder.
   3. Stepladders must only be used in the fully locked-open position and never leaned against a vertical surface as a straight ladder.
   4. Stepladders longer than 20 feet may not be used.

D. Extension Ladders
   1. Definition: A non-self-supporting ground ladder that consists of two or more sections traveling in guides, brackets, or the equivalent, arranged so as to allow length adjustment.
   2. Two section extension ladders that may extend longer than 60 feet shall not be used.
   3. To ensure a safe position, the horizontal distance from the vertical support structure to the foot of the ladder is one-fourth (25%) the working length of the ladder; I.E. 1 foot out per 4 feet up.

4. The ladder must be secured from foot kick out or slipping.
5. An extension ladder may not be used in a horizontal position as a platform or runway.

E. Fixed Ladders
1. Definition: A fixed ladder is a vertical ladder mounted permanently to a structure.
2. Metal ladders and all components must be painted or otherwise treated to resist corrosion and rusting when location demands.
3. Cages, wells, ladder safety devices, or self-retracting lifelines shall be provided on ladders of more than 20 feet in length.
4. When ladders are used to ascend to heights exceeding 20 feet, landing platforms must be provided for each 30 feet of height or fraction thereof.
5. Exception: where no cage, well, or ladder safety device is provided, landing platforms must be provided for each 20 feet of height or fraction thereof.
6. Each ladder section shall be offset from adjacent sections. Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset.
7. Ladder safety devices may be used on tower, water tank, and chimney ladders over 20 feet in unbroken length in lieu of cage protection.
   a. No landing platforms are required for this type of ladder construction.
   b. All ladder safety devices such as those that incorporate full body harness, friction brakes, and sliding attachments must meet the design requirements of the ladders which they serve.

14. SURFACE AND WALL OPENINGS

29 CFR 1910.23
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9715

A. Definition: An opening is a gap or void in a walking/working surface, platform, floor, roof, or wall through or into which materials or persons are capable of falling.
1. Construction Industry: The opening is a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.
2. General Industry: The opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a pipe opening, or slot opening.

B. Hole Covers
1. Covers located in vehicular traffic areas must be able to support at least twice the maximum axle load of the largest vehicle expected to cross over them
2. Covers where only foot traffic is allowed must be able to support at least twice the weight of employees, equipment, and materials that may be imposed on them.
3. Covers must be secured to prevent accidental movement by wind, equipment, or employees
4. Temporary covers must be marked with the word "HOLE" or "COVER" to provide warning of the hazard.
5. While the cover is not in place, the floor hole must be constantly attended by someone or shall be protected by a standard railing to provide a means of prevention from accidental entry (falls).

C. Wall Openings
1. Fall protection systems such as guardrail systems, restraint systems, or positioning systems must be used by employees working on, at, above, or near wall openings (including those with chutes attached) where:
   a. The outside bottom edge of the wall opening is 6 feet or more above lower levels, and
   b. The inside bottom edge of the wall opening is less than 39 inches above the walking/ working surface.

D. Skylights
1. If there is an exposure or threat of falling through a skylight to a lower level, the skylight shall be guarded by:
   a. A fixed standard railing on all exposed sides OR
   b. Other type fall protection system or a fall protection plan OR
   c. A standard skylight screen (refer to specifications below)
2. Skylight screens must be of construction and mounting such that the screen is capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen.
3. Screens must also be constructed and mounted so that under ordinary load or impact will not result in downward deflection sufficient enough to break the glass below them.
4. Screen construction must consist of grillwork with openings not more than 4 inches long or of slat work with openings not more than 2 inches wide with length unrestricted.

15. FALL PROTECTION RESCUE PLAN GENERAL PROVISIONS

Occupational Health & Safety Article
http://ohsonline.com/Articles/2011/07/01/The-Most-Overlooked-Aspect-of-Fall-Protection.aspx

A. A fall protection rescue plan must minimize the time to bring a fallen worker to safety.
B. All foreseeable factors must be considered when planning an effective rescue of victims, which include:
   1. Potential condition of the victim, particularly head, neck, and back injuries
   2. Weather conditions
   3. Physical obstacles both on the ground and aloft
   4. Other potential additional hazards, such as electrical lines and excavations
C. All employees involved with any part of the fall protection system must be informed of the rescue plan.
D. All rescue plans (Appendix G) must be reviewed by all affected employees to ensure that the procedures are manageable and realistic.
E. If a positioning system and or fall-arrest system is not used, the Fall Protection Hazard Assessment form (Appendix F) must be used.
F. All affected employees must be informed of the potential of orthostatic intolerance and suspension trauma (refer to https://www.osha.gov/dts/shib/shib032404.html), including:
   1. Signs and symptoms
   2. Factors that affect the degree of risk

16. INSPECTION AND MAINTENANCE OF EQUIPMENT

A. General provision: In order to maintain service life and performance, all fall protection equipment must be inspected, stored, and maintained properly.
   1. Equipment must never be used for any purpose other than personal fall arrest functions.
B. Inspection prior to use
   1. All components of the personal fall arrest system must be inspected by the trained user prior to every use.
   2. Any defective components must be removed from service and reported to the department supervisor.
   3. Defective equipment must be forwarded Environmental Health and Safety for disposal.
C. Annual Inspection
   1. A trained, competent person must complete an annual inspection of all the Personal Fall Arrest System equipment.
   2. Documentation must be maintained by each department and be available for Environmental Health and Safety review.
   3. Inspection Checklist forms in Appendices A-E must be used to log each piece of personal fall arrest equipment, for both inventory and inspection records.
   4. All equipment exposed to a fall must be removed from service immediately, tagged with notice, and forwarded to Environmental Health and Safety for disposal.
D. Storage of Fall Protection Equipment
   1. Equipment should hung in a cool, dry location in a manner that retains its shape.
   2. Equipment must not be stored near sources of excessive heat, moisture, sunlight, or other weather elements.
   3. Equipment must not be stored near chemicals or sources of chemical fumes.
   4. Equipment must be stored so as to avoid buildup of dirt, grease, or other contaminants.
   5. Equipment must not be stored on the ground or in containers with other items piled on top of the equipment (such as inside toolboxes).
E. Maintenance of Fall Protection Equipment
   1. Any defect found on equipment must never be repaired; the device must be tagged with notice, and forwarded to Environmental Health and Safety for disposal.
   2. Cleaning or laundering of equipment must be performed according to all manufacturer's guidelines and/or specifications.
   3. Equipment must only be cleaned with a mild, nonabrasive soap and hang to dry.
   4. Equipment must never be heat or force (machine) dried; heat could affect material integrity.

17. TRAINING

A. General Provisions
   1. MCW will establish and maintain a Fall Protection training schedule in order to provide the best possible awareness and safety measures to its employees.
   2. MCW will provide training to ensure that:
      a. The purpose, function, and proper use of fall protection is understood by employees,
      b. The knowledge and skills required for the safe application and usage is acquired by employees.
      c. Any employee whose work operations are, or may be, in an area that fall protection devices may be utilized, will be instructed to an awareness level concerning hazards associated with fall protection operations.
B. Initial Training will enable all affected employees to:
   1. Be familiar with different types of fall protection equipment appropriate for use.

2. Identify fall hazards associated with the work locations and the work to be completed.
3. Understand the procedures for removal of protection devices from service for repair or replacement.
4. Know how to preserve and keep equipment in working order.
5. Understand equipment inspection requirements.
6. Know the procedures of donning and doffing equipment
7. Understand the equipment strengths and limitations.
8. Recognize some other options such as safety nets, guardrails, controlled access zones, and safety monitoring system.

C. Refresher Training
1. Refresher training will be conducted at a minimum of every three years.
2. Retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.
3. Refresher training will be required more frequently if any of the following conditions are met:
   a. A need is identified through annual self-assessment
   b. A change in fall protection equipment occurs
   c. A new fall hazard area is added
   d. A change in a previously documented hazard area occurs
   e. Inadequacies in employee knowledge are demonstrated
   f. A periodic inspection reveals, or whenever MCW has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of fall protection equipment or procedures.
   g. The fall protection procedure outright fails or a near-miss occurs

D. Certification
1. All training must be documented.
2. Training records will be available for audits and self-assessments.
3. Attendance records shall be kept with sign-in sheets showing the name of attendees, date, instructor, and type of training.
4. Training records will be maintained by the Environmental, Health, and Safety office.

18. RECORDS AND DOCUMENT CONTROL

A. All Fall Hazard Assessment forms (Appendix F) and the fall protection rescue form (Appendix G) will be stored at each individual department.
B. A copy of all forms must be forwarded to the Environmental Health & Safety office.
C. The fall protection equipment inspection forms (Appendix A-E) will be kept at each individual department and be available for Environmental Health & Safety or auditors to review.

19. REFERENCES

29 CFR 1910.21-30 Subpart D (walking working surfaces) of the Occupational Safety and Health Administration (OSHA).

29 CFR 1910.66 Subpart F (powered platforms) of the Occupational Safety and Health Administration (OSHA).

29 CFR 1926.104 Subpart E (personal protected and life-saving equipment) of the Occupational Safety and Health Administration (OSHA)

29 CFR 1926.450 Subpart L (scaffold) of the Occupational Safety and Health Administration (OSHA).

29 CFR 1926.500 Subpart M (fall protection) of the Occupational Safety and Health Administration (OSHA).

29 CFR 1926.1050 Subpart X (ladders) of the Occupational Safety and Health Administration (OSHA).

American National Standards Institute (ANSI) Z359 Fall Protection Code

Appendix A: Full Body Harness Inspection Checklist

Full Body Harness Model: _____ Manufacture Date: _____ / _____

Serial Number: _____ Purchase Date: _____

General Factors	Inspection	Circle Result	Comments
HARDWARE: Includes D-Rings, buckles, keepers & back pads	Inspect for damage, distortion, sharp edges, burrs, cracks & corrosion	Accepted Rejected	
WEBBING:	Inspect for cuts, burns, abrasions, frays, discoloration, excessive soiling	Accepted Rejected	
STITCHING:	Inspect for pulled or cut stiches	Accepted Rejected	
LABELS:	Make certain all labels are securely held in place and legible	Accepted Rejected	
OTHER: (describe)		Accepted Rejected	
OTHER: (describe)		Accepted Rejected	
OTHER: (describe)		Accepted Rejected	

Inspected By: _____ Date: _____

If any part of the inspection is rejected, the harness must be taken out of service and destroyed.

Removed from service and destroyed by: _____ Date: _____

*Departments must keep this record on file for one year and available for Environmental Health & Safety to review

Appendix B: Lanyards Inspection Checklist

Lanyard Model: _____ Manufacture Date: _____ / _____

Serial Number: _____ Purchase Date: _____

General Factors	Inspection	Circle Result	Comments
HARDWARE: Includes snap hooks, carabiners, adjusters, keepers, thimbles, & D-Rings	Inspect for damage, distortion, sharp edges, burrs, cracks, corrosion & proper operation	Accepted Rejected	
WEBBING:	Inspect for cuts, burns, tears, abrasions, frays, discoloration & excessive soiling	Accepted Rejected	
STITCHING:	Inspect for pulled or cut stitches	Accepted Rejected	
SYNTHETIC ROPE:	Inspect for pulled or cut yarns, burns, abrasions, knots, discoloration & excessive soiling	Accepted Rejected	
WIRE ROPE:	Inspect for broken wires, corrosion, kinks & separation of strands	Accepted Rejected	
ENERGY ABSORBING COMPONENT:	Inspect for elongation, tears & excessive soiling	Accepted Rejected	
LABELS:	Make certain all labels are securely held in place and legible	Accepted Rejected	
OTHER: (describe)		Accepted Rejected	

Inspected By: _____ Date Inspected: _____

If any part of the inspection is rejected, the lanyard must be taken out of service and destroyed.

Removed from service and destroyed by: _____ Date: _____

*Departments must keep this record on file for one year and available for Environmental Health & Safety to review

Appendix C: Hooks & Carabiners Inspection Checklist

Hook/Carabiner Model: _____ Manufacture Date: _____ / _____

Serial Number: _____ Purchase Date: _____

General Factors	Inspection	Circle Result	Comments
HARDWARE: (Includes D-Rings)	Inspect for damage, distortion, sharp edges, burrs, cracks, corrosion	Accepted Rejected	
WEBBING:	Inspect for cuts, burns, tears, abrasions, frays, discoloration & excessive soiling	Accepted Rejected	
STITCHING:	Inspect for pulled or cut stitches	Accepted Rejected	
LABELS:	Ensure all labels are held securely and legible	Accepted Rejected	
OTHER:	Specify:	Accepted Rejected	
OTHER:	Specify:	Accepted Rejected	

Inspected By: _____ Date Inspected: _____

If any part of the inspection is rejected, the Hooks / Carabiner must be taken out of service and destroyed.

Removed from service and destroyed by: _____ Date: _____

*Departments must keep this record on file for one year and available for Environmental Health & Safety to review

Appendix D: Tie-Off adaptors/Anchorage Plates Inspection Checklist

Tie-Off Adaptor/Anchorage Plate Model: _____ Manufacture/Lot Date: _____ / _____

Serial Number: _____ Purchase Date: _____

General Factors	Inspection	Circle Result	Comments
PHYSICAL DAMAGE:	Inspect for cracks, sharp edges, burrs, deformities, locking operation	Accepted Rejected	
EXCESSIVE CORROSION:	Inspect for corrosion which affects operation and/or strength	Accepted Rejected	
FASTENERS:	Inspect for corrosion, tightness, damage and distortion; If WELDED: Inspect welds for corrosion, cracks, and damage	Accepted Rejected	
MARKINGS:	Ensure all markings are legible	Accepted Rejected	
OTHER:	Specify:	Accepted Rejected	
OTHER:	Specify:	Accepted Rejected	

Inspected By: _____ Date Inspected: _____

If any part of the inspection is rejected, the Tie-Off Adaptor must be taken out of service and destroyed.

Removed from service and destroyed by: _____ Date: _____

*Departments must keep this record on file for one year and available for Environmental Health & Safety to review

Appendix E: Self Retracting Lifelines Inspection Checklist / Log

Self-Retracting Lifeline Model: _____ Manufacture Date: _____ / _____

Serial Number: _____ Purchase Date: _____

General Factors	Inspection	Circle Result	Comments
IMPACT INDICATOR:	Inspect for activation: rupture of stitching, elongation of indicator	Accepted Rejected	
SCREWS & FASTENERS:	Inspect for damage and check all for proper tightness	Accepted Rejected	
HOUSING & ANCHORING LOOP:	Inspect for distortion, cracks, or other damage	Accepted Rejected	
LIFELINE:	Inspect for cuts, burns, tears, abrasions, frays, broken wires, excessive soiling & discoloration	Accepted Rejected	
LOCKING ACTION:	Inspect for proper lock-up of brake mechanism	Accepted Rejected	
RETRACTION/ EXTENSION:	Inspect spring tension by pulling lifeline fully out and allowing full retraction: no slack evident	Accepted Rejected	
HOOKS & CARABINERS: (Refer to Appendix C; Inspection Checklist for Hooks & Carabiners)	Inspect for physical damage, corrosion, proper operation & markings	Accepted Rejected	
RESERVE LIFELINE:	Inspect reserve lifeline retention systems for deployment	Accepted Rejected	
LABELS:	Ensure all labels are securely attached and 100% legible	Accepted Rejected	

Inspected By: _____ Date Inspected: _____

If any part of the inspection is rejected, the Self Retracting Lifelines must be taken out of service and destroyed.

Removed from service and destroyed by: _____ Date: _____

*Departments must keep this record on file for one year and available for Environmental Health & Safety to review.

Appendix F: Fall Protection Hazard Assessment Plan

FALL PROTECTION HAZARD ASSESSMENT PLAN	
Building:	Location:

FALL HAZARD ASSESSMENT CHECKLIST	Circle:	
1. Can an employee enter the area without restriction and perform work?	YES	NO
2. Are fall prevention systems such as cages, guardrails, toe boards, and man lifts in place?	YES	NO
3. Have slipping and tripping hazards been removed or controlled?	YES	NO
4. Have visual warnings of fall hazards been installed?	YES	NO
5. Can the distance a worker fall be reduced by installing platforms, nets, etc.?	YES	NO
6. Are any permanently installed floor coverings, gratings, hatches, or doors missing?	YES	NO
7. Does the location pose any other recognized safety or health concerns?	YES	NO
8. Is the space designated as a Permit Required Confined Space?	YES	NO
9. Will work be performed near (above or below) power lines?	YES	NO
10. Will work be performed near telecommunications equipment?	YES	NO
11. Will work be performed near fume hood stacks?	YES	NO
12. Have anchor points been designated, tested, and inspected?	YES	NO
13. Are weather conditions acceptable for work (light conditions, wind, wet footing, snow, & lightning)?	YES	NO
14. Other:		

Assessment Information

Initials	Hazard	Information	Remarks/Recommendations
	Total potential fall distance (feet):		
	Number of workers involved:		
	Frequency of task:		
	Obtainable anchor point strength (lbs.):		
	Required anchor point strength (lbs.):		

Additional Requirements:

• Potential environmental conditions that could affect safety:

Initials	Condition	Remarks/ Recommendations:

• Possible required structural alterations:

Initials	Condition	Remarks/ Recommendations:

• Possible task modification that may be required:

Initials	Condition	Remarks/ Recommendations:

• Breakdown of vertical and horizontal movement (sketch out work task):

• Training requirements:

Initials	Requirement	Remarks/ Recommendations

• Personal Protective Equipment required:

Initials	Requirement	Remarks/ Recommendations

AUTHORIZATION

☐ Approved

I certify that I have conducted the Fall Protection Hazard Assessment Plan of the location designated above and have detailed the findings of the assessment on this form. *Further details on attachment? ☐ Yes ☐ No

Name:	Signature:	
Title:	Date:	Time:

ASSESSMENT FORM RETENTION INFORMATION		ATTACHMENTS	
Permanent Retention File:	Location:	☐ YES	☐ NO
Date Filed:	Filed By:	*See Following Pages	
☐ Approved by EH&S	Name:	Date:	

**Departments must keep this record on file for one year and a copy must be given to Environmental Health & Safety

Appendix G: Fall Protection Rescue Plan

FALL PROTECTION RESCUE PLAN	
All suspended workers must be rescued as safely and quickly as possible!	
Building:	Location:
Date job started:	Date job ended:
Type of work being performed:	Number of workers who could require rescue:

FALL PROTECTION EQUIPMENT TO BE USED		Circle:	
1. Ladder?	☐ Extension ☐ Straight ☐ Step ☐ Truck ☐ Rope	YES	NO
2. Scissors Lift?	Height:	YES	NO
3. Articulated Boom Lift?	Height:	YES	NO
4. Scaffold?	Height:	YES	NO
5. Self Rescue?		YES	NO
6. Rope & Pulley System?	☐ Lower Down ☐ Raise Up	YES	NO
7. Controlled Descent Device?		YES	NO
8. Self-Raising/ Self-Lowering System?		YES	NO
9. Self-Retracting Life Line?	Capable of Raising or Lowering: ☐ YES ☐ NO	YES	NO
10. Other (explain):		YES	NO

ASSESSMENT of POTENTIAL RESCUE HAZARDS (please indicate specifics with initials)		
Initials	Hazard	Remarks/ Recommendations
	Total potential fall distance (feet):	
	Number of workers involved:	
	Ground not level:	
	Underground tunnel:	
	Electrical Lines:	
	Traffic: ☐ People ☐ Vehicles ☐ Both	
	Water:	
	Vegetation:	
	No obtainable anchor point:	
	Anchor point not strong enough for worker & rescuer:	
	Weather:	
	Other (explain):	

Trained rescue Personnel On-site			
Name	Equipment Required	Phone Contact	Remarks/Recommendations

AUTHORIZATION		☐ APPROVED
Name:		Signature:
Title:	Date:	Time:

**Departments must keep this record on file for one year and a copy must be given to Environmental Health & Safety

Appendix H: Daily Scaffold Safety Inspection and Tags

Inspection Criteria	Circle:	
Have all personnel been properly trained in the safe use of the scaffold type being used?	YES	NO
Is a "Competent Person" in charge of scaffold erection, dismantling, moving, or alteration?	YES	NO
Have hazardous conditions been identified and guarded against, including:	YES	NO
Overhead Power Lines?	YES	NO
Wind Loading?	YES	NO
Potential washout of footing?	YES	NO
Potential uplift?	YES	NO
Is the frame spacing and mud sill size capable of bearing the intended load?	YES	NO
Are ALL scaffold components and planking in safe condition and graded for scaffold use?	YES	NO
Are mud sills properly placed and of adequate size?	YES	NO
Have screw jacks been used to level and plumb scaffold? *Unstable objects such as loose bricks and/or concrete blocks may not be used!*	YES	NO
Are base plates and/or screw jacks in FIRM contact with mud sills and frame?	YES	NO
Is the scaffold level and plumb?	YES	NO
Are all scaffold legs braced, with ALL braces properly attached?	YES	NO
Has proper access been provided?	YES	NO
Ladder type: maximum spacing between rungs may not exceed 16 ¾ inches	YES	NO
Are ALL ladder type end frames aligned vertically?	YES	NO
Are ALL working level platforms fully planked?	YES	NO
Does ALL platform planking extend 6" to 12" beyond the supports of the scaffold frame?	YES	NO
Is the scaffold free of any makeshift device or ladder that increases the working height of the scaffold?	YES	NO
Are guard rails in place on ALL open sides of scaffold platforms 6 feet or more in elevation?	YES	NO
Has the scaffold been secured to the structure at least every 30 feet in length and 26 feet in height?	YES	NO
Have free standing towers been guyed or tied every 26 feet in height?	YES	NO

MANUALLY PROPELLED MOBILE SCAFFOLDS:		
Is the tower height less than 4 times the minimum base width?	YES	NO
Are casters of proper size and have effective locking devices?	YES	NO
Are casters and ALL frames locked together?	YES	NO
Are screw jacks extended to less than 12 inches?	YES	NO
Has horizontal diagonal bracing been installed at the base of the scaffold and at intermediate levels of 20 feet?	YES	NO

NOTIFICATION		
If scaffold is complete and passes daily inspection, has a Daily Inspection Tag been filled out, signed and posted at the access point?	YES	NO
If the scaffold is incomplete, has an INCOMPLETE SCAFFOLD tag been filled out, signed, and posted at the access point?	YES	NO
If the scaffold has failed daily inspection for any reason, has a "DANGER Do Not Use Scaffold" tag been placed at the access point, and authorized persons notified?	YES	NO

AUTHORIZATION	☐ APPROVED ☐ Incomplete ☐ Failed	
Name:	Signature:	
Title:	Date:	Time:

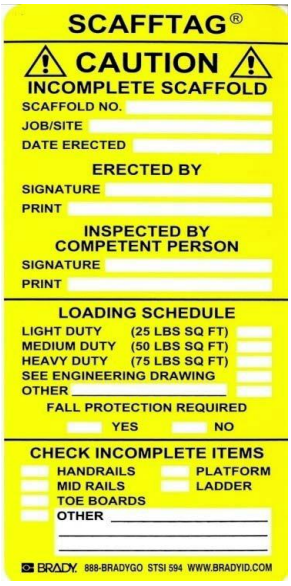
**Departments must keep this record on file for one year and a copy must be given to Environmental Health & Safety

Appendix I: Examples of Scaffold Inspection Tags

Any tag must be completed daily and posted at the access point of the scaffold in a plainly visible location.

"PASSED"
Scaffold does not require additional personal fall protection

"PASSED"
Scaffold requires additional personal fall protection



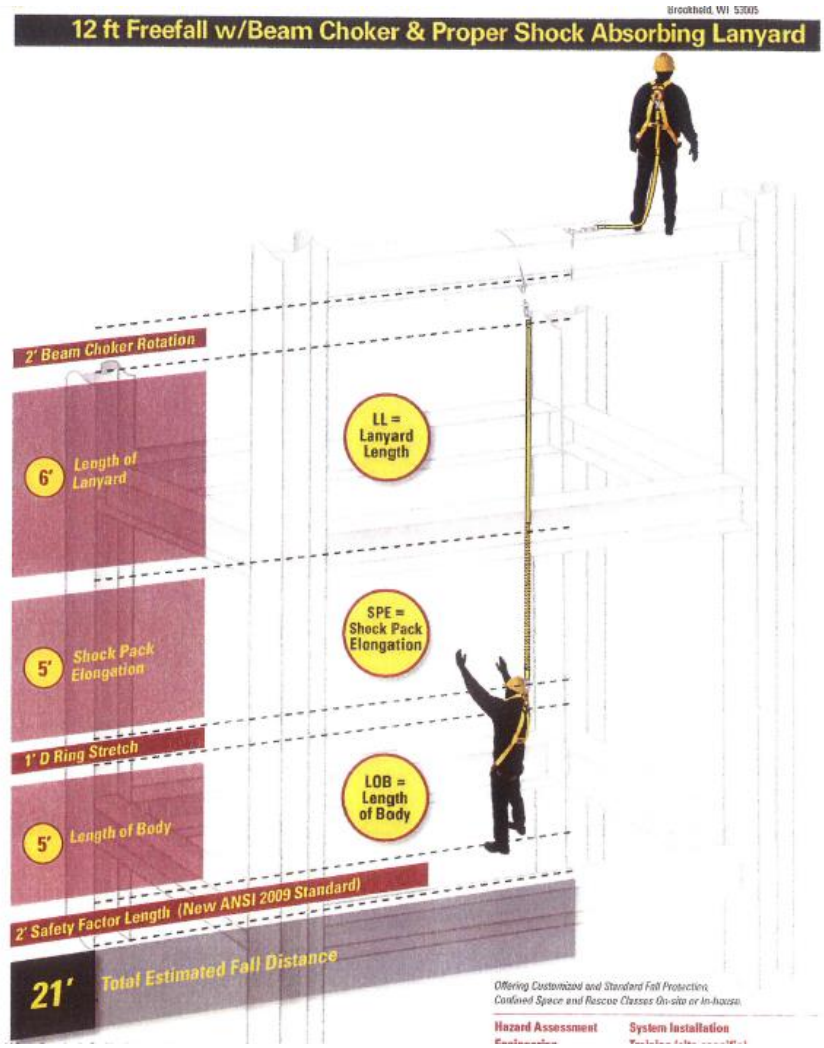
"INCOMPLETE"
Scaffold may not be used until fully completed, and marked with a "PASSED" tag as above.

"FAILED"
Scaffold may not be used!

Appendix J: Calculation of Fall Distance

All factors of the fall system must be considered when calculating total fall distance to ensure a worker does not impact the lower surface.

The diagram to the right shows the factors that must be considered:



The distance the anchoring device used will "stretch", such as a beam choker or horizontal lifeline cable must be added:
2 feet

The length of the lanyard:
6 feet

The elongation of the shock pack:
5 feet

D-Ring and Harness stretch:
1 foot

The height of the worker (from floor to D-Ring connection):
5 feet

MINIMUM safety factor:
2 feet

TOTAL: 21 feet

Note: Self-retracting lifelines use a cam lock system to provide a shorter fall distance as the line locks out in less than 2 feet (or design length). The line also self retracts to reduce potential trip hazard due to the slack of a fixed length lanyard. Thus, the fall distance would be reduced by 9 feet; the 11 feet of lanyard length and shock pack elongation would be replaced with a 2 foot lock out length of the self-retracting lifeline. The total fall distance would be reduced to 12 feet, and the actual free-fall distance reduced from 14 feet to 5, significantly reducing the potential for injury.

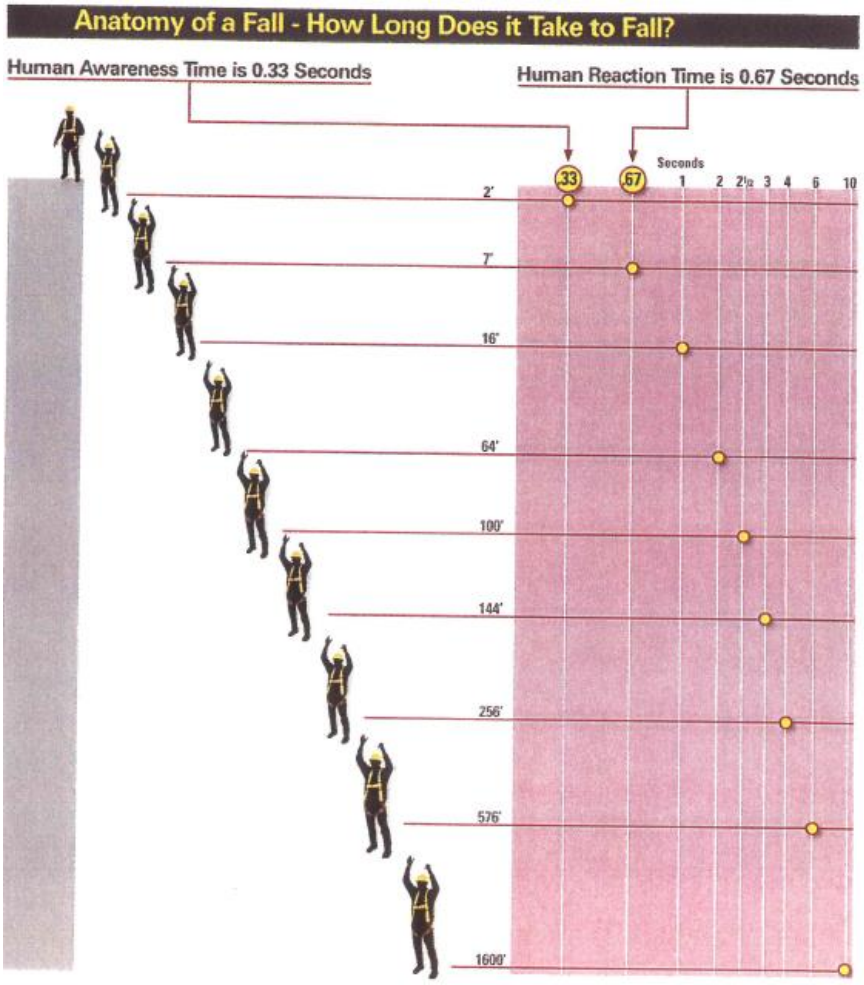
Appendix K: Awareness & Reaction Time and Fall Rate

Science has shown that the time the average person's Awareness Time to realize an event is occurring- such as a fall- (awareness time) is about 0.33 seconds. This means that it takes about a third of a second for the brain to comprehend that the body has fallen off an edge!

Furthermore, it requires an additional 0.33 second for the brain to cause a physical reaction in attempt to grab hold of something, or whatever reaction takes place. This is called Reaction Time.

In 0.67 seconds, a body falls approximately 7 feet, due to the acceleration of gravity- 32 feet/second^2. Whatever handhold a worker would attempt to grab to stop his fall will now be 7 feet away and well out of reach!

The chart below illustrates how far a body can fall in a certain time. It takes only 2 seconds for a body to fall 64 feet- roughly the height of a 6 story building.



To look at falls another way, because gravity accelerates a body (up to terminal velocity), the higher the fall, the harder the impact.

A body falling only 10 feet will impact the ground at a little over 17 miles per hour, whereas the victim of that 2 second, 64 foot fall mentioned above would hit at about 43.7 mph!