
BYU

BRIGHAM YOUNG
UNIVERSITY

Provo, Utah

FALL PROTECTION PROGRAM

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1.0 OVERVIEW

Workplace falls consistently account for over 40% of the fatalities that occurred within the construction industry. Follow-up investigations generally conclude that almost all serious falls were preventable. OSHA standards require fall protection devices and/or equipment when employees may be exposed to falls of 4 feet or more. Fall protection systems include personal fall arrest systems, standard guardrails, hole covers, ladders (if used properly), and other approved equipment. When buildings or other structures are designed, or refurbished, permanent fall protection systems must be included. Employees must be appropriately trained to meet local, state, and federal requirements. Training records must be properly documented and maintained. Work projects must be consistently monitored for compliance, and supervisors must be authorized to correct unsafe conditions.

2.0 POLICY

Brigham Young University will provide fall protection training in accordance with OSHA standards for all employees exposed to falls of 4 feet or more. Departments will evaluate the potential fall exposure for each function performed by their employees, and designate the fall protection devices required. All fall protection systems and equipment will be purchased and maintained by the department. All systems and equipment will be used in accordance with manufacturer recommendations.

3.0 REQUIREMENTS

29 CFR 1910 Subparts D & F
29 CFR 1926 Subparts M & X

4.0 PURPOSE

This program has been developed to help minimize the potential for injury from serious falls at Brigham Young University, and to assist departments/contractors in understanding what measures they must take to protect their employees.

5.0 SCOPE

This program applies to all Brigham Young University employees, contractors, and university facilities.

6.0 PROCEDURES

6.1 General

- Assess the workplace and the work being performed to identify areas where individuals are exposed to a potential fall of 4-feet or more.
- Ensure that individuals receive the proper training prior to engaging in work where they will be exposed to a fall of 4-feet or more.

- Where feasible, install permanent protective systems to prevent individuals from falling – permanent protective systems include fixed ladders (with cages if longer than 20-feet), hole covers, standard guardrails and other barriers such as fencing.
- If permanent protective systems are not feasible then install temporary protective systems while individuals are exposed (where feasible) to prevent individuals from falling. Temporary protective systems include scaffolding, safety nets, hole covers, and temporary guardrails.
- Individuals must utilize a personal fall arrest system when permanent and/or temporary protective systems are not feasible and/or are inadequate – a personal fall arrest system includes a full body harness, lanyard, and lifeline (or equivalent gear). *Note: a safety belt cannot be utilized as part of a personal fall arrest system.*
- Prior to beginning roof construction, repair, or maintenance, the crew chief, foreman, or person in charge of the project must insure that the area below the work site is isolated to help prevent unauthorized entry. Barrier tape or other means may be used.
- During general construction employees shall not be involved in outdoor work that involves the use of fall protection during periods of high winds (i.e. when a wind advisory has been issued), lightning storms, snow storms, or other potentially hazardous weather conditions. Hazards are assessed by the supervisor.
- All systems and equipment utilized for fall protection must be rated and approved by the manufacturer for their intended use.
- Maintain fall protection in accordance with manufacturer recommendations.

Note: occasionally there is an area where a guardrail or other permanent fall protection system cannot be installed and a personal fall arrest system is not feasible (i.e. the leading edge of a theatrical stage). For such situations a Fall Protection Plan must be developed by the Department responsible for the area/work. If you have any questions regarding what type of fall protection to utilize please contact Risk Management & Safety (422-4468) for an assessment and recommendation.

- A fall protection plan, which involves controlled access zones, can be created and utilized only when workers are engaged in leading edge work, pre-cast concrete erection work, residential construction work, or where it can be demonstrated that it is not feasible, or creates a greater hazard, to use a conventional fall protection system. If a fall protection plan is needed then departments are responsible for creating the document, by following the guidance found in OSHA's Fall Protection standard 29 CFR 1926.502(k), which is available online at www.osha.gov, and submitting it to Risk Management & Safety for review prior to implementation.

6.2 Boatswain's Chairs

- Boatswain's chairs may only be used for applications specified by the manufacturer (i.e. window washing applications).

6.3 Catch Platforms

- A substantial catch platform shall be installed below the working area of roofs more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 without a parapet. The platform shall extend 2 feet in width beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

6.4 Hole Covers

- When not guarded by a standard guardrail system (or equivalent), floor holes must be guarded by a cover that is of standard strength. A cover of standard strength is able to safely support any persons and their loads that may be placed on the cover. Hole covers must be fixed in place to prevent them from being accidentally displaced. Temporary hole covers must be signed "Floor Hole". When hole covers are opened, floor holes must be guarded using a standard guardrail system, or by having an attendant at the opening of the hole until the proper guarding is once again put back into place. *Note: Manholes must be guarded using a standard manhole cover or guardrail system when open.* Skylights qualify as floor holes and can be guarded by using a standard guardrail system, cover of standard strength, or any other equally effective means.

6.5 Use of Hoisting Lines

- When hoisting lines are used to raise tools or materials to a roof greater than 16 feet from ground to eaves without a parapet (or with a parapet less than 30 inches in height), the employee on the roof shall be secured by an approved body harness attached to a lifeline.
- The lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

6.6 Ladders

- Ladders must be ascended and descended while facing the rungs.
- Individuals must use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- Tool belts or other equally effective means must be used to carry equipment up and/or down the ladder. Equipment that is awkward and/or heavy enough to cause an individual to lose their balance must not be carried up or down a ladder.
- Portable ladders need to be replaced by fixed ladders when the ladders will be needed on a permanent basis.

6.7 Portable Ladders

- Prior to using any ladder, the user is to inspect the ladder to ensure that it is in good working order, in accordance with the ladder manufacturer recommendations. The user must also read the labels attached to a ladder prior to using the ladder. If the labels are missing then the ladder must not be used. Damaged ladders are not to be used, instead they are to be removed from service and either repaired and/or replaced.
- Once a portable ladder has been positioned for use, the user must ensure that the ladder footing is firm, level, and stable. The top of a portable extension ladder must be anchored to the surface being accessed at the top when it is used under windy conditions, and/or when the ladder is susceptible to being displaced. Do not place

portable ladders on top of other objects to obtain additional height (e.g. boxes, barrels, and scaffolding).

- Extension ladders must be set up so that for each four feet in height, the base is brought out one foot (the rise and run are at a 4:1 ratio), see figure 1.
- Extension ladders must extend beyond the surface being accessed by at least three feet.
- Not more than one person is allowed on a ladder.
- Ladders must be ascended and descended while facing the rungs.
- Individuals must use at least one hand to grasp the ladder when progressing up and/or down the ladder.

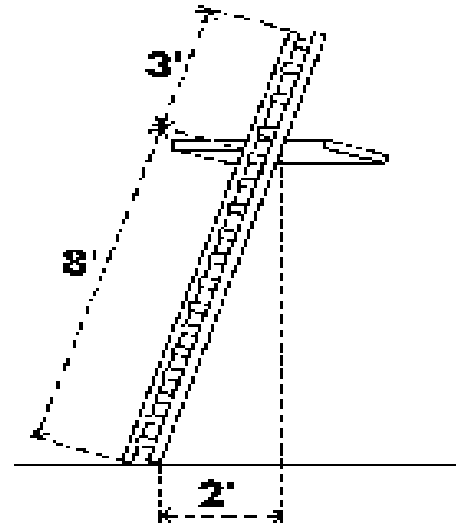


Figure 1

- Provisions must be taken to ensure that the base of a portable ladder is secure and separated from traffic to prevent the ladder from being displaced.
- If the ladder must be set up in front of a door then measures must be taken to block use of the door while the ladder is present. Once the work is completed, the ladder must be removed and the door reinstated for use as soon as possible.
- A person working from a ladder must not lean to the side in manner that puts their center of gravity beyond the side rails of the ladder unless the person is also properly using a personal fall arrest system. Ladders must not be tampered with while occupied.
- Only use non-conductive ladders around open live electrical sources.

6.8 Fixed Ladders

- All fixed ladders must be designed and installed in accordance with the most current OSHA standard, which can be accessed online at:
www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9719

6.9 Personal Fall Arrest Systems

- A personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations thereof. *Note: As of January 1, 1998, the use of a body belt for fall arrest is prohibited.*
- Components of a personal fall arrest system must be manufactured, approved for fall protection, and must only be used for the purpose intended by the manufacturer. Personal fall arrest systems and components subjected to impact loading must be immediately removed from service and not used again until inspected and determined

by a competent person to be undamaged and suitable for use. Personal fall arrest system components must meet the following requirements:

- Self made personal fall arrest systems, and components thereof, are prohibited;
- Components (i.e. full body harnesses, connectors, Dee-rings, snaphooks, and anchorages) of a personal fall arrest system must be manufactured by a reputable company, and used only in accordance with manufacturer recommendations;
- Anchorages used for attachment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or must be designed, installed, and used as follows:
 - As part of a complete personal fall arrest system that maintains a safety factor of at least 2; and
 - Under the supervision of a qualified person.
- Connectors must have a corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of the system.
- Dee-rings and snaphooks must be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snaphooks must be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or must be a locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.
- Unless the snaphook is a locking type and designed for the following connections, snaphooks must not be engaged:
 - Directly to webbing, rope or wire rope;
 - To each other
 - To a dee-ring to which another snaphook or other connector is attached;
 - To a horizontal lifeline; or
 - To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.
- On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline must be capable of locking in both directions on the lifeline.
- Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.
- When vertical lifelines are used, each employee must be attached to a separate lifeline, except when constructing elevator shafts. Two employees may be attached to a single vertical lifeline in the hoistway of an elevator shaft that is being constructed, provided both employees are working atop a false car that is equipped with guardrails; the strength of the lifeline is 10,000 pounds and all other criteria have been met.
- Self-retracting lifelines and lanyards that automatically limit free fall distance to 2-feet or less must be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position. Those (ripstich, tearing, and deforming lanyards) that don't limit free fall distance to 2-feet or less must be able to sustain a minimum tensile load of 5,000 pounds applied in the fully extended position.

- The attachment point of a body harness must be located in the center of the wearer's back near shoulder level, or above the wearer's head. The opposite attachment point must not be to guardrail systems, nor to hoists. At hoist areas, the personal fall arrest system must be rigged to allow the movement of the employee only as far as the edge of the walking working surface.
- Personal fall arrest systems, when stopping a fall must:
 - Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness;
 - Be rigged such that an employee can neither free fall more than 6-feet, nor contact any lower level or object;
 - Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet; and
 - Have sufficient strength to withstand twice the potential impact energy of an employee free fall a distance of 6-feet, or the free fall distance permitted by the system, whichever is less.
- Horizontal lifelines must be designed, installed, and used, under the supervision of a qualified person.
- Personal fall arrest systems must be inspected prior to each use for wear, damage and other deterioration, and defective components must not be used (they must be removed from service).
- Prompt rescue must be provided in the event of a fall, or departments must assure that employees are able to rescue themselves should they fall wearing a personal fall arrest system.

6.10 Roof Brackets

- Roofing brackets must be constructed to fit the pitch of the roof.
- In addition to the pointed metal projections, brackets must be secured by nailing in place. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent.

6.11 Safety Belts

- *Safety belts can be used as positioning devices, not for fall arrest.* A positioning device prevents a worker from free falling by prohibiting access to leading edges and other points at which a fall may occur. Safety belts must be at least one and five-eighths inches wide. Anchorage points must be capable of supporting at least twice the potential impact load if an employee were to fall or 3,000 pounds whichever is greater. Connectors must be drop forged, pressed or formed steel, or made of equivalent materials; and must have a corrosion-resistant finish, and all surfaces must be smooth to prevent damage to interfacing parts of the system. Note: Connecting assemblies must have a minimum tensile strength of 5,000 pounds.
- Dee-rings and snaphooks must be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snaphooks must be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or must be a locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.

- Unless the snaphook is a locking type and designed for the following connections, snaphooks must not be engaged:
 - Directly to webbing, rope or wire rope;
 - To each other
 - To a dee-ring to which another snaphook or other connector is attached;
 - To a horizontal lifeline; or
 - To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.
- Safety belts must be inspected prior to each use for wear, damage and other deterioration, and defective components must not be used (they must be removed from service).
- The attachment point of a body belt must be located in the center of the wearer's back.

6.12 Safety Nets

- Safety nets can be used as a protective system so long as they are installed as close as practical under the walking/working surface on which employees are working, but in no case more than 30 feet below such level. The potential fall area from the walking/working surface to the net must be unobstructed. Safety nets must extend outward from the outermost projection of the work surface in accordance with manufacturer information.
- Safety nets must be installed with sufficient clearance beneath them to prevent contact with the surface or structures below them when subjected to an impact force equal to the drop test specified by the manufacturer. Drop tests must be performed just after installation and prior to being used as a protective system.
- Safety nets must be inspected at least once a week, and following any occurrence which could affect the integrity of the safety net system, for wear, damage, and other deterioration. Defective nets must not be used, and must be removed from service. Safety nets must also be removed from service if they have been used to catch a falling person.
- Materials, pieces of scrap, equipment, and tools that have fallen into the safety net must be removed as soon as possible from the net and at least before the next work shift.
- Self made safety nets are not allowed for use as a protective system.

6.13 Scaffolding

- Individuals ascending/descending a scaffold must maintain three points of contact at all times and use the scaffold ladder or stairs.
- Any scaffolding utilized as fall protection must include a guardrail system on all open sides, which includes a toe board as recommended by the manufacturer. Scaffolds and their components must be capable of supporting without failure at least four times the maximum intended load (six times the maximum intended load if using a wire or fiber rope for suspension of the scaffold), and must not be overloaded.

- Scaffolding must meet the following criteria:
 - Self made scaffolding must not be used.
 - A complete scaffold consists of all necessary components having been properly mounted in accordance with the manufacturers design specifications. Incomplete scaffolds must not be used, and all components must be in good proper working condition – damaged components/scaffolding must not be used. Scaffolding must only be used for the purpose intended by the manufacturer of the scaffold.
 - Unstable objects such as barrels, boxes, loose brick, concrete block, etc. must not be used to support scaffolding or planks.
 - The footing or anchorage must be sound, rigid and capable of carrying the maximum intended load without setting or displacement.
 - Scaffolds must not be altered or moved horizontally while they are in use/occupied.
 - All wooden planking must be of the proper Scaffold Grade.
 - All planking/platforms must be overlapped a minimum of 12-inches or be secured from movement. And, planks must extend over their end supports between 6-18 inches.
 - Access onto the scaffolding must be via a (safe) access ladder.
 - Scaffold poles, legs, or uprights must be plumb, and securely and rigidly braced to prevent swaying and displacement. Scaffolds must be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means (window cleaners' anchor bolts must not be used).
 - Materials being hoisted onto a scaffold must have a tag line.
 - Overhead protection must be provided when needed – including a screen between the upper rail and toe board if persons will pass below.
 - Persons must not work on scaffolds during storms, high winds, or when the scaffold is covered with snow/ice.
 - Tools and materials must not be allowed to accumulate on scaffolding.
- If the use of the protective systems listed above is infeasible or the use thereof would create a greater hazard, then alternative fall protection systems, such as but not limited to warning line systems and safety monitoring systems, can be utilized. However, if an alternative method is used then the department is responsible for creating a plan for proper use of the system and attaching the plan to this program in Appendix B. Guidance for creating a plan can be obtained online at www.osha.gov by accessing the applicable standard.

Note: Ladder-jack scaffolds must be limited to light duty and must not exceed a height of 20-feet above the floor or ground.

6.14 Standard Guardrail Systems

- When they can be used, standard guardrail systems are the preferred protective system.
- A standard guardrail system consists of a top rail, intermediate rail, and posts. Other than the railing on staircases, the top rail must have a vertical height of 42 inches nominal as measured from the working surface (floor, platform, ramp, etc.) to the top surface of the top rail. The top rail on a staircase must be positioned between 30 and

34 inches in height, as measured from the forward edge of the stair tread to the upper surface of the top rail. Top rails must have a smooth surface. The intermediate rail (or mid-rail) must be approximately halfway between the top rail and the working surface. Railing must not constitute a projection hazard. And, the railing system must be able to withstand a load of 200 pounds of pressure, applied in any direction at any point on the top rail.

- Standard guardrail systems must be equipped with a 2-inch toe-board when persons will be located below.

Note: construction sites, and similar temporary work, may construct a temporary guardrail system however permanent guardrails must be installed elsewhere.

7.0 RESPONSIBILITIES

7.1 Departments:

- Maintain manufacturer instructions and manuals that are included with fall protection systems, and make them readily available to those employees who may need to reference such materials;
- Identify all tasks performed by their employees that are in need of systems and equipment for protecting against falls of 4-feet or more;
- Provide necessary funding for purchase and installation of systems and equipment utilized for fall protection;
- Investigate incidents involving falls or near falls and take corrective actions to prevent future falls from occurring;
- When needed, develop fall protection plan(s) and keep it/them with a copy of the most current Brigham Young University Fall Protection program. *Note: a fall protection plan is needed when individuals cannot use the fall protection systems and procedures outlined in this program.*
- Select a competent person, or persons, who will provide requisite fall protection training.

7.2 Competent Persons:

- Are capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to individuals, and who have authorization to take prompt corrective measures to eliminate them.
- Initiate and maintain a progressive disciplinary program that includes up to termination of employment for those who choose not to utilize fall protection when required and trained to do so.
- Develop Fall Protection Plans if necessary and submit them to Risk Management and Safety.

7.3 Supervisors:

- Ensure that fall protection is installed/put-on and used in accordance with manufacturer recommendations (see user manual for details).
- Ensure new and existing employees receive fall protection training as outlined in section 8.0 of this program;

- Do not knowingly assign work that exposes individuals to a fall of 4 or more feet unless fall protection is available and will be utilized;
- Ensure personal fall arrest systems are maintained according to manufacturer recommendations; and
- Complete a Supervisor Checklist (Appendix B) and maintain it for two years.

7.4 University Employees:

- Do not remove or damage systems or equipment utilized for fall protection;
- Do not use damaged systems or equipment utilized for fall protection, and report any damaged systems or equipment to your supervisor;
- Unless using fall protection, do not perform work where exposed to a potential fall of 4-feet or more, unless using an appropriate fall protection system; and
- Do not use, set-up, or install equipment or systems utilized for fall protection until you have received the proper training as outlined in this program.

7.5 Risk Management and Safety:

- When requested, help managers and supervisors select proper fall protection;
- Monitor implementation of this program and collect information regarding campus fall protection needs.
- Revise this program, as needed.

8.0 TRAINING

8.1 General

- All users of personal fall arrest systems, scaffolding, ladders, or other fall protection systems must receive fall protection training prior to engaging in activities where they are exposed, or potentially exposed to a fall of 4 feet or more. This training includes:
 - The nature of the fall hazards in the work area;
 - Correct procedures for erecting, maintaining, disassembling, and inspecting systems and equipment utilized for fall protection;
 - As applicable, the use and operation of permanent, temporary, and personal fall arrest systems;
 - Any limitations of the systems or equipment being used for fall protection;
 - Any roles assigned to employees;
 - The correct procedures necessary for handling and storage of equipment and materials;
- All information provided by the manufacturer for safe and proper use of systems and/or equipment being utilized for fall protection.
- Retraining is needed anytime a worker demonstrates that they lack the knowledge necessary to use the protective system or equipment in accordance with manufacturer recommendations or when changes in the workplace render previous training obsolete.

8.2 Competent Person

- Competent persons must receive training that allows them to identify existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to individuals.

8.3 Training Records

- Training must be documented by creating a training record that contains the name and BYU ID of the trained individuals, the date of training, and the name and signature of the competent person providing the training. Only the most current training records need be retained.

9.0 MONITORING

9.1 Departments

- Provide training and equipment necessary to meet OSHA Standards.
- Collect and maintain the following documents:
 - Initial and annual training records.
 - Supervisor Checklist (Appendix B). Completed checklists must be maintained by the department responsible for the evaluation for at least two years, and be provided to Risk Management & Safety upon request.

9.2 Supervisors

- Review documents submitted by competent persons to ensure they are completed properly, and that all safety needs are addressed.
- Review and approve all alternate fall protection plans.
- Monitor worksites for compliance.

9.3 Competent Person

- Monitor worksite procedures for compliance with all fall protection guidelines.
- Stop projects when unsafe conditions or situations are discovered.

9.4 Risk Management and Safety

- Review all records received, and evaluate them completeness and accuracy.
- Monitor the submission of required records and reports.
- Maintain a permanent record of all documents received.
- Provide additional training as may be necessary to ensure compliance with the Fall Protection Program.
- Perform random assessments of field activities related to fall protection, and provide feedback to the respective departments.
- Review and respond to all comments and suggestions received from departments, supervisors, or employees pertaining to the Fall Protection Program.

10.0 APPENDIX

APPENDIX A Definitions

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

Body belt (safety belt) means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means 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.

Buckle means any device for holding the body belt or body harness closed around the employee's body.

Competent Person means one 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 means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or dee-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

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

Dangerous equipment means equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

Deceleration device means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Equivalent means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

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

Free fall distance means 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. 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.

Guardrail system means a barrier erected to prevent employees from falling to lower levels.

Hole means a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface. *Note: holes meeting the smallest dimensions are guarded to prevent items from being kicked or dropped down them, and to prevent individuals from twisting their ankle, or receiving a similar injury.*

Infeasible means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

Lanyard means 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.

Leading edge means the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) 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 means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

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

Lower levels are those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

Mechanical equipment means all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop-carts.

Opening is used to describe a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

Overhand bricklaying and related work means 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 means 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 combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Positioning device system means 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.

Rope grab means 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.

Roof means the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.

Roofing work means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

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

Self-retracting lifeline/lanyard means 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 means a connector comprised of a 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. Snaphooks are generally one of two types:

- 1) The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
- 2) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Steep roof means a roof having a slope greater than 4 in 12 (vertical to horizontal).

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

Unprotected sides and edges include any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.

Walking/working surface means 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 means 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, body belt, or safety net systems to protect employees in the area.

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

APPENDIX B Supervisor Checklist Fall Protection Program

Date of Assessment:

Name of Assessor:

Note: "No" answers are undesirable.

Yes	No	Questions
<input type="checkbox"/>	<input type="checkbox"/>	1. Have work tasks been evaluated to determine those that require the use of fall protection?
<input type="checkbox"/>	<input type="checkbox"/>	2. Are fall protection needs relayed from employees to supervisors then to department managers?
<input type="checkbox"/>	<input type="checkbox"/>	3. Are fall protection needs addressed before allowing individuals to engage in work where they are exposed to a fall potential of 4-feet or more?
<input type="checkbox"/>	<input type="checkbox"/>	4. Do all individuals utilize fall protection when needed?
<input type="checkbox"/>	<input type="checkbox"/>	5. Are employees trained in accordance with manufacturer recommendations prior to using or installing fall protection devices?
<input type="checkbox"/>	<input type="checkbox"/>	6. Are fall protection devices inspected and maintained in accordance with manufacturer recommendations?
<input type="checkbox"/>	<input type="checkbox"/>	7. Are ladders 20-feet (or longer) equipped with a cage, or do individuals who ascend/descend cage-less ladders (20-feet or longer) use a drop rope, rope grab, and full body harness?
<input type="checkbox"/>	<input type="checkbox"/>	8. If used, are ladders and scaffolds secured in place prior to use?
<input type="checkbox"/>	<input type="checkbox"/>	9. If using a personal fall arrest system, is the lanyard anchor point rated to 5000 lbs or more?

Note: This checklist is not intended to be a comprehensive checklist, but has been provided as a tool for Supervisors/Departments to measure how much improvement is needed, if any.