I. OVERVIEW
The information included in this Fall Protection Program is in compliance with applicable California Code of Regulations including but not limited to Title 8 Section 1504, 1620-1621, 1669-1671, and 3209-3214. There are many specific requirements for the various types of fall protection and this program does not include all of the details for specific requirements. Please see applicable Cal/OSHA regulations for specific information and exceptions.

II. SCOPE
Fall protection includes primary fall protection or engineering controls used to prevent falls such as guardrails and secondary fall protection which refers to anchorages and all of the devices that a user attaches to the anchorage (i.e. lanyards, harnesses). This program includes requirements for both types of fall protection.

Employees whose work exposes them to falling in excess of 6 feet to a lower level when working in construction or construction related activities near the perimeter of a structure, or on unprotected sides and edges not otherwise adequately protected shall use approved fall protection including personal fall arrest, personal fall restraint or positioning systems.

Fall protection requirements also apply during general industry work tasks. For example, guardrails are required on all open sides of unenclosed elevated work locations such as roof openings, landings, balconies, or porches on working levels more than 30 inches above the floor, ground, or other working areas.

Contractors working on campus are required to comply with all applicable Cal/OSHA regulations. Contractor safety programs shall be available for review upon request by EHS.

III. POLICY
It is the policy of San Diego State University that any individual participating in work activities on elevated surfaces where there is a fall hazard on San Diego State University property will comply with the procedures and requirements in this document and in the Injury and Illness Prevention Program.

IV. PURPOSE
The purpose of this program is to provide good practices, procedures, and training to employees participating in work activities on elevated surfaces to prevent falls while performing work tasks.

V. DEFINITIONS
A summary of applicable definitions is provided below.

Aerial Lift Device: Equipment such as powered platforms, vehicle mounted elevated and rotating work platforms, extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers and powered industrial truck platforms.

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

May 2015
**Body Belt (Safety Belt)**: A simple or compound strap with means for securing it about the waist and for securing a lanyard to it.

**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.

**Buckle**: Any device for holding the body belt or body harness closed around the employee's body.

**Competent Person**: 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**: 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 carabiner, or it may be an integral component of part of the system (such as a buckle or D-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)**: An area in which certain work may take place without the use of guardrails, personal fall arrest systems, or safety nets and access to the zone is controlled.

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

**Deceleration Device**: 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**: 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.

**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.

**Drop Line (Safety Line)**: A vertical line from a fixed anchorage, independent of the work surface, to which the lanyard is affixed.

May 2015
**Cal/OSHA Equivalent:** An alternate design, feature, device, or protective action which provides an equal degree of safety.

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

**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. 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/Railing:** A barrier consisting of a top rail and a midrail secured to uprights and erected along the exposed sides and ends of platforms.

**Handrail:** A rail used to provide employees with a handhold for support.

**Hole:** Any opening in a floor or platform, which is smaller than an opening.

**Infeasible:** 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.

**Ladder:** A device other than a ramp or stairway, designed for use in ascending or descending at an angle with the horizontal. A ladder is intended to be stationary while in service and consists of two side pieces called siderails, joined at short intervals by crosspieces called steps, rungs or cleats.

**Lanyard:** A flexible line to secure a wearer of a safety belt or harness to a drop line, lifeline, or fixed anchorage.

**Leading Edge:** 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:** A horizontal line (i.e. catenary line) between two fixed anchorages, independent of the work surface, to which the lanyard is secured either by tying off or by means of a suitable sliding connection. For the purposes of these orders, lifelines may be vertical as well as horizontal (i.e. when used with a body harness).

**Lower Levels:** 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.

May 2015
Mechanical Equipment: All motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcarts.

Midrail: A rail approximately midway between the top rail and platform that is secured to the uprights erected along the exposed sides and ends of platforms.

Opening: An opening in any floor or platform, 12 inches or more in the least horizontal dimension. It includes: stairway floor openings, ladderway floor openings, hatchways and chute floor openings.

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 combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Personal Fall Protection System: A personal fall protection system includes personal fall arrest systems, positioning device systems, fall restraint systems, safety nets and guardrails.

Personal Fall Restraint System: A system used to prevent an employee from falling. It consists of anchorages, connectors, body belt/harness. It may include, lanyards, lifelines, and rope grabs designed for that purpose.

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

Qualified Person, Attendant or Operator: A person designated by the employer who by reason of training, experience or instruction has demonstrated the ability to safely perform all assigned duties and, when required, is properly licensed in accordance with federal, state, or local laws and regulations.

Ramp: A surfaced sloping passageway connecting two different levels.

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 Belt or Harness: A device specifically for the purpose of securing, suspending, or retrieving a worker in or from a hazardous work area.

Safety Line: One that is provided to protect a worker from falls caused by failure of scaffolds, working platforms, or loss of balance, and shall extend to within 4 feet of ground or other stable surface.

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

May 2015
Scaffold: Any temporary, elevated structure used for the support of a platform.

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 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.

Stairs/Stairways: A series of steps and landings having 2 or more risers leading from one level or floor to another.

Toeboard: A barrier secured along the sides and ends of a platform at the platform level used to guard against the falling of material.

Unprotected Sides and Edges: 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 standard guardrail or protection provided.

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.

Wall 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.

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, body belt, or safety net systems to protect employees in the area.

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

VI. RESPONSIBILITIES

A. Environmental Health & Safety is responsible to:
   • Maintain and update the written Fall Protection Program at SDSU.
   • Work with applicable departments to maintain a fall protection equipment inventory list.
   • Assist applicable department staff with training coordination and other activities described in this written program, as needed.
   • Work with Managers and Supervisors to coordinate inspections of fall protection equipment, if applicable.

B. SDSU Managers and Supervisors are responsible to:
   • Ensure training is provided and the applicable information contained in this written program is communicated to applicable employees who use the equipment.
   • Maintain records of the training completed.

May 2015
• Work with employees to assess the need to use fall protection equipment.
• Work with employees to select the proper fall protection equipment.
• Monitor employee compliance with all requirements in this written program.
• Work with EHS to coordinate inspections of fall protection equipment.
• Notify EHS when new equipment is purchased so it can be added to the inventory list, if applicable.
• Dispose of any unsafe equipment.

C. Employees who use fall protection are responsible to:
• Comply with all Cal/OSHA and manufacturer requirements pertaining to Fall Protection.
• Understand and follow the requirements of the SDSU Fall Protection Program.
• Follow safe work procedures.
• Select and inspect fall protection equipment prior to each use and use equipment in a safe manner.
• Report all unsafe conditions, practices, or damaged equipment to the Supervisor.

D. Contractors are responsible to:
• Comply with all Cal/OSHA and manufacturer requirements pertaining to Fall Protection.

VII. SPECIFIC REQUIREMENTS/PROCEDURES

A. Personal Fall Arrest Systems, Positioning Devices, and Personal Fall Restraint Systems

1. General Information
   a. Approved personal fall arrest, personal fall restraint or positioning systems shall be worn by those employees whose work exposes them to falling in excess of 6 feet from the perimeter of a structure, unprotected sides and edges, leading edges, through shaftways and openings, sloped roof surfaces steeper than 7:12, or other sloped surfaces steeper than 40 degrees not otherwise adequately protected.

   b. When work is performed from thrustouts or similar locations, such as trusses, beams, purlins, or plates of 4-inch nominal width, or greater, at elevations exceeding 15 feet above ground, water surface, or floor level below and where temporary guardrail protection is impracticable, employees shall be required to use an approved personal fall protection system. When this is impractical, approved safety nets shall be used. When the work is of short duration (i.e., non-repetitive) and limited exposure and the hazards involved in rigging and installing the safety devices equals or exceeds the hazards involved in the actual construction, these provisions may be temporarily suspended, provided adequate risk control is recognized and maintained under immediate, competent supervision.

   c. There are specific Cal/OSHA requirements relating to fall protection for employees working at elevated locations on poles, towers and other electrical and telecommunications structures, roofing operations, and steel erection operations. These requirements are not included in this written program. See Cal/OSHA regulations for specific requirements.

May 2015
2. Personal Fall Arrest Systems

Used to slow and stop a person during a fall from an elevated location.

a. Harnesses

The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

Body belts shall not be used as part of a personal fall arrest system.

b. Lifelines and Lanyards

On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.

When vertical lifelines are used, each employee shall be attached to a separate lifeline.

Lifelines shall be protected against being cut or abraded.

Lifelines subject to excessive fraying or rock damage shall be protected and shall have a wire rope center. Seriously worn or damaged rope shall be promptly removed from service.

Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet or less shall 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.

Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet 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.

c. Anchorages

Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms. They shall be capable of supporting at least 5,000 pounds per employee attached or they shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two and under the supervision of a qualified person.
d. Use

Personal fall arrest systems, when stopping a fall, shall:

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, and where practicable the anchor end of the lanyard shall be secured at a level not lower than the employee's waist;

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 falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

Personal fall arrest systems shall not be attached to hoists, nor shall they be attached to guardrails.

When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the working level or working area.

All fall arresting, descent control, and rescue equipment shall be approved as defined in the Cal/OSHA Regulations and used in accordance with the manufacturer's recommendations.

e. Rescue

The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

The campus procedure includes dialing “911” to contact University Police for assistance.

f. Equipment Inspection

Personal fall arrest systems shall be inspected prior to each use for wear, damage, and other deterioration.

Defective components shall be removed from service.

Each personal fall arrest system shall be inspected not less than twice annually by a competent person in accordance with manufacturer’s recommendations.
The date of each inspection shall be documented.

3. **Positioning Device Systems**
   Used to hold a worker in place while allowing a hands free work environment at elevated heights.
   a. **Use**
      
      Not designed for fall arrest and therefore must be used with a fall arrest system.
      
      Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet.
      
      The use of non-locking snaphooks is prohibited.
   
   b. **Equipment Inspection**
      
      Equipment shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.
   
   c. **Anchorages**
      
      Anchorage points for positioning device systems shall be capable of supporting two times the intended load or 3,000 pounds, whichever is greater.

4. **Personal Fall Restraint**
   Personal fall restraint systems are used to restrict the worker's movement to prevent reaching a location where a fall hazard exists.
   
   These systems are not designed for fall arrest and therefore must be used with a fall arrest system.
   
   a. **Body Belts and Harnesses**
      
      Body belts or harnesses may be used for personal fall restraint.
      
      Body belts shall be at least one and five-eights (1-5/8) inches wide.
      
      Body belts used in conjunction with fall restraint systems or positioning devices shall limit the maximum arresting force on an employee to 900 pounds.
   
   b. **Anchorages**
      
      Anchorage points used for fall restraint shall be capable of supporting 4 times the intended load.
      
      Lifelines and anchorages shall be capable of supporting a minimum dead weight of 5,000 pounds. An exception is retractable lanyards, controlled descent and rescue
devices provided they are approved as defined in California Code of Regulations Title 8 Sections 1504 and 1505.

c. Lanyards

Lanyards shall be secured to a substantial member of the structure or to securely rigged lines.

d. Use

All equipment shall be used in accordance with the manufacturer's recommendations.

Restraint protection shall be rigged to allow the movement of employees only as far as the sides of the working level or working area.

If an employee's duties require horizontal movement, rigging shall be provided so that the attached lanyard will slide along with the employee. Such rigging shall be provided for all suspended staging, outdoor advertising sign platforms, floats, and all other catwalks, or walkways 6 feet or more above the ground or level beneath.

Any lanyard, safety belt, harness, dropline, lifeline or other component subjected to in-service loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding. “In-service loading” refers to loading equivalent to that received in a drop test. Exception: Retractable lanyards, controlled descent and rescue devices provided they are approved as defined in California Code of Regulations Title 8 Sections 1504 and 1505.

All safety belts, harnesses and lanyards placed in service or purchased on or before February 1, 1997, shall be labeled as meeting the requirements contained in ANSI A10.14-1975, Requirements for Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Construction and Industrial Use.

All personal fall arrest, personal fall restraint and positioning device systems purchased or placed in service after February 1, 1997, shall be labeled as meeting the requirements contained in ANSI A10.14-1991 American National Standard for Construction and Demolition Use, or ANSI Z359.1-1992 American National Standard Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components.

B. Fall Protection Equipment (FPE) General Information

1. Use/Storage

FPE shall only be used for operations it was designed for.

Body belts, harnesses, and components shall be used only for employee protection and not to hoist materials.
A personal fall protection system consists of an anchorage connector, body wear, and a connecting device to join them.

The load rating must be attached or permanently printed on each piece of equipment and must be readable by the person using the equipment.

The user shall plan the use of the equipment based on load capacity.

Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers except for when they are used in conjunction with hot work where the lanyard may be exposed to damage from heat or flame.

The conditions of the work environment must be considered to determine if there will be any effects on the system.

FPE should be adjusted so that it is comfortable and has the attachment points appropriate for its use.

FPE shall be stored in a dry clean place not subject to dust or weather and in such a way that it cannot be damaged.

2. Training

Employees participating in job tasks involving the use of a personal fall protection system shall receive training.

Review of safe use procedures and other topics pertaining to the use of a personal fall protection system during tailgate meetings is recommended.

Training includes but is not limited to:

- The application limits of the equipment.
- The proper hook-up, anchoring, and tie-off techniques including determination of elongation and deceleration distances.
- Methods of use, inspection, and storage of equipment.
- A Rescue Plan for contacting University Police in the event a person has fallen and is suspended in a harness.

3. Inspection/Maintenance

Prior to each use the FPE shall be checked to ensure for example:

- The snap hooks or any other means of attachment operate appropriately.
The webbing, straps, and buckles are in good condition, no damage.

The brakes and ratchets in self retracting lanyards and winches operate appropriately.

There is no mildew, wear, damage and other imperfections.

Damaged FPE shall be removed from service and given to the Department Manager or Supervisor.

Follow manufacturer’s instructions for cleaning equipment.

See Fall Protection Equipment Inspection Sheet Attachment 1 for more information.

VIII. Fall Protection Plan, Controlled Access Zones, and Safety Monitoring Systems

A. Fall Protection Plan

A Fall Protection Plan is required during construction operations when it can be shown that the use of conventional fall protection is impractical or creates a greater hazard.

The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrails, personal fall arrest systems, or safety nets) are infeasible or why their use would create a greater hazard.

A single site fall protection plan is required for sites where the construction operations are essentially identical.

A copy of the fall protection plan with all approved changes shall be maintained at the job site.

The implementation of the fall protection plan shall be under the supervision of a competent person.

The plan shall document the identity of the competent person.

The fall protection plan shall include a written discussion of other measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection provided by conventional fall protection systems. For example, the employer shall discuss the extent to which scaffolds, ladders, or vehicle mounted work platforms can be used to provide a safer working surface and thereby reduce the hazard of falling.

The fall protection plan shall be prepared by a qualified person and developed specifically for the site where the construction work is being performed and the plan shall be maintained up to date. Any changes to the fall protection plan shall be approved by a qualified person.

The fall protection plan shall identify each location where conventional fall protection methods cannot be used. These locations shall then be classified as controlled access zones and the
employer must comply with the criteria included in the **Controlled Access Zones** section of this document.

Where no other alternative measure (i.e. scaffolds, ladders, vehicle mounted work platforms, etc.) has been implemented, the employer shall implement a safety monitoring system in conformance with the **Safety Monitoring Systems** section of this document.

In the event an employee falls, or some other related, serious incident occurs (e.g., a near miss), the employer shall investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g., new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents.

**B. Controlled Access Zones**

Controlled Access Zones shall be used to control access to areas where leading edge and other operations are taking place.

They shall be defined by a control line or warning line or by any other means that restricts access.

Signs shall be posted to warn unauthorized employees to stay out of the controlled access zone.

Only designated employees shall enter the controlled access zones.

The fall protection plan must include a statement which provides the name or other method of identification for each employee (i.e., job title) who is designated to work in controlled access zones. No other employees may enter controlled access zones.

When control lines are used, they shall be erected not less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when erecting precast concrete members.

When erecting precast concrete members, the control line shall be erected not less than 6 feet nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge.

The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a standard railing or wall, or securely anchored on each end.

Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

Each line shall be flagged or otherwise clearly marked at not more than 6-foot intervals with high-visibility material.
Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches from the working level/working area and its highest point is not more than 45 inches.

Each line shall have a minimum breaking strength of 200 pounds.

C. Safety Monitoring Systems

The employer shall designate a competent person to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements:

The safety monitor shall be competent to recognize fall hazards;

The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;

The safety monitor shall be within visual sighting distance of the employee and shall always be in communication with the employee being monitored; and,

The safety monitor shall not have other responsibilities which could take the monitor’s attention from the monitoring function.

No employee, other than an employee covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

Each employee working in a controlled access zone shall be directed to comply promptly with fall hazard warnings from safety monitors.

IX. Safety Nets

A. Where the elevation is 25 feet or more above the ground, water surface, or continuous floor level below, and when the use of personal fall arrest systems, personal fall restraint systems, positioning device systems or more conventional types of protection are clearly impractical, the exterior and/or interior perimeter of the structure shall be provided with an approved safety net extending at least 8 feet horizontally from such perimeter and being positioned at a distance not to exceed 10 feet vertically below where such hazards exist, or equivalent protection provided safety nets shall extend outward from the outermost projection of the work surface as follows:

If the vertical distance from working level to horizontal plane of net is up to 5 feet then the minimum required horizontal distance of outer edge of net from the edge of working surface is 8 feet.

If the vertical distance from working level to horizontal plane of net is more than 5 feet up to 10 feet then the minimum required horizontal distance of outer edge of net from the edge of working surface is 10 feet.
If the vertical distance from working level to horizontal plane of net is more than 10 feet but not to exceed 30 feet then the minimum required horizontal distance of outer edge of net from the edge of working surface is 13 feet.

B. Nets shall be hung with sufficient clearance to prevent user's contact with the surfaces or structures below. Such clearances shall be determined by impact load testing. Cal/OSHA allows exceptions for flooring requirements and nets for steel erection in tiered buildings and structures. See applicable Cal/OSHA Regulations.


D. Safety nets purchased before January 1, 1998 shall be labeled as meeting the requirements of ANSI A10.11-1979, Safety Nets Used During Construction, Repair and Demolition Operations, or ANSI A10.11-1989.

X. Permanent Guardrails

A. Guardrails shall be provided on all open sides of unenclosed elevated work locations or working levels more than 30 inches above the floor, ground, or other working areas of a building, such as: roof openings, open and glazed sides of landings, balconies or porches, platforms, runways, and ramps.

Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed.

The railing shall be provided with a toeboard where the platform, runway, or ramp is 6 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment.

See specific Cal/OSHA requirements for exceptions. One exception includes platforms, runways, ramps, or other working levels less than 4 feet above floor, ground, or other working level constructed prior to January 1, 1967. For best practice when practicable these are included in current requirements.

B. The unprotected sides of elevated work locations that are not buildings or building structures where an employee is exposed to a fall of 4 feet or more shall be provided with guardrails.

Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed.

The railing shall be provided with a toeboard where the platform, runway, or ramp is 6 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment.
See specific Cal/OSHA requirements for exceptions. Exceptions include but are not limited to elevated locations used infrequently by employees if the employees using them are protected by a fall restraint/fall arrest system and where the guardrail requirements are impracticable due to machinery requirements or work processes, an alternate means of protecting employees from falling, such as personal fall protection systems, shall be used.

C. An opening in a wall or partition not provided with a glazed sash, having a height of at least 30 inches and a width of at least 18 inches, through which a person might fall to a level 30 inches or more below, shall be guarded by a guardrail or other barrier of such construction and mounting that the guardrail or barrier is capable of withstanding a force of at least 200 pounds applied horizontally at any point on the near side of the guardrail or barrier.

Barriers may be of solid construction, grillwork with openings not more than 8 inches long, or of slatwork with openings not more than 4 inches wide with unrestricted length.

D. Guardrail Requirements

Wherever guardrail protection is required a standard guardrail shall consist of top rail, midrail or equivalent protection, and posts, and shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the floor, platform, runway, or ramp level. The permissible tolerance on height dimensions is one inch.

The top rail shall be smooth-surfaced throughout the length of the railing.

The midrail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp.

The ends of the rails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.

An exception includes: Other types and arrangements of guardrail construction will be acceptable where the height, surface and end projection of the top rail complies with the standard specifications and the closure of the vertical area between the top rail and floor, platform, runway, or ramp provides protection at least equivalent to that afforded by a mid-rail.

Local building regulations may require 9-inch spacing of midrails.

All guardrails and other permissible types, including their connections and anchorage, shall be designed for a live load of 20 pounds per linear foot applied either horizontally or vertically downward at the top rail.

It is recognized that the minimum value of railing strength here specified is inadequate for safety under operating conditions where railings are liable to receive heavy stresses.
from crowds, trucking, handling materials, etc. For such conditions, additional strength shall be provided by use of heavier stock, closer spacing of posts, bracing, or otherwise.

Railing members shall be framed in such a position that they will afford the greatest support and protection, for example, top rails of structural steel angles shall have the outside face of vertical leg located on the side adjacent to the side of normal contact by the employee.

See Cal/OSHA regulations for specific examples of acceptable guardrail specifications and specific requirements for the design and construction of non-permanent railings.

XI. Stair Rails and Hand Rails

A. Stairways shall have handrails or stair railings on each side, and every stairway required to be more than 88 inches in width shall be provided with not less than one intermediate stair railing for each 88 inches of required width.

Intermediate stair railings shall be spaced approximately equal within the entire width of the stairway.

Intermediate stair railings may be of single rail construction.

Exceptions include: Stairways less than 44 inches in width may have one handrail or stair railing except that such stairways open on one or both sides shall have stair railings provided on the open side or sides; stairways having less than four risers need not have handrails or stair railings; stairways giving access to portable work stands less than 30 inches high; stairs that follow the contour of tanks or other cylindrical or spherical structures where the construction requires the inside clearance between the inside stair stringer and wall or tank side to be 8 inches or less, shall not be considered an "open side"; and guardrails may be erected provided a handrail is attached.

B. A stair railing shall be of construction similar to a guardrail but the vertical height shall be in compliance with these requirements.

Stair railings on open sides that are 30 inches or more above the surface below shall be equipped with midrails approximately one half way between the steps and the top rail.

Local building standards may require 4-inch spacing of intermediate vertical members.

The top of stair railings, handrails and handrail extensions installed on or after April 3, 1997, shall be at a vertical height between 34 and 38 inches above the nosing of treads and landings. For stairs installed before April 3, 1997, this height shall be between 30 and 38 inches.
Stair railings and handrails shall be continuous the full length of the stairs and, except for private stairways, at least one handrail or stair railing shall extend in the direction of the stair run not less than 12 inches beyond the top riser nor less than 12 inches beyond the bottom riser.

Ends shall be returned or shall terminate in newel posts or safety terminals, or otherwise arranged so as not to constitute a projection hazard.

C. A handrail shall consist of a lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail so as to offer no obstruction to a smooth surface along the top and both sides of the handrail.

The handrail shall be designed to provide a grasping surface so the person using it does not fall.

The spacing of brackets shall not exceed 8 feet.

Handrails projecting from a wall shall have a space of not less than 1 1/2 inches between the wall and the handrail.

The mounting of handrails shall be such that the completed structure is capable of withstanding a load of at least 200 pounds applied in any direction at any point on the rail. An exception includes handrails and stair rails on flights of stairs serving basements or cellars that are covered by a trap door, removable floor or grating when not in use, shall stop at the floor level or entrance level so as not to interfere with the cover in the closed position.

XII. Toeboards

A. A railing shall be provided with a toeboard where the platform, runway, or ramp is 6 feet or more above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment.

B. Toeboards shall be constructed of wood, concrete, metal, or other suitable material. When grill mesh is used it shall not exceed 1 inch.

C. The top of the toeboard shall not be less than 3 1/2 inches above the platform, walkway, or other working level and the bottom clearance shall not exceed 1/4 inch.

D. When materials are piled, higher toeboards, or paneling from floor to intermediate rails or top rail shall be provided where necessary for safety.

E. See specific details in California Code of Regulations Title 8 Section 3209 and 3210.

XIII. Railings and Toeboards Used During Construction Activities

May 2015
A. Unless otherwise protected, non-permanent railings during construction activities shall be provided along all unprotected and open sides, edges and ends of all built-up scaffolds, runways, ramps, rolling scaffolds, elevated platforms, surfaces, wall openings, or other elevations 6 feet or more above the ground, floor, or level underneath. Exceptions include: Float and ladder jack scaffold; bricklayers' and masons' scaffolds used in accordance with applicable Cal/OSHA Regulations; and during demolition on the floor or surface being demolished.

B. A standard toeboard shall be 4 inches (nominal) minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp.

C. It shall be securely fastened in place and have not more than 1/4-inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over one inch in greatest dimension.

D. Toeboards shall be provided on all open sides and ends of railed scaffolds at locations where persons are required to work or pass under the scaffold and at all interior floor, roof, and shaft openings. Exception includes: for structural steel crafts.

E. Where material is piled to such height that a standard toeboard does not provide protection, paneling or screening from floor to intermediate rail or top rail shall be provided. Where such paneling or screening extend to the toprail, midrails may be omitted.

XIV. Wall Openings

A. An opening in a wall or partition not provided with a glazed sash, having a height of at least 30 inches and a width of at least 18 inches, through which a person might fall to a level 30 inches or more below, shall be guarded by a guardrail or other barrier.

B. The construction and mounting shall ensure that the guardrail or barrier is capable of withstanding a force of at least 200 pounds applied horizontally at any point on the near side of the guardrail or barrier.

C. Barriers may be of solid construction, grillwork with openings not more than 8 inches long, or of slatwork with openings not more than 4 inches wide with unrestricted length.

D. See specific Cal/OSHA requirements in California Code of Regulations Title 8, Section 3211.

XV. Floor Openings and Floor Holes

A. Every floor and roof opening shall be guarded by a cover, a guardrail, or equivalent on all open sides.

B. While the cover is not in place, the openings shall be constantly attended by someone or shall be protected by guardrails.

May 2015
C. Toeboards shall be installed around the edges at openings where persons may pass below the opening.

D. See Cal/OSHA Regulations for details regarding exceptions for stairway entrances.

E. Every floor opening or platform with access provided by ladderway shall be protected by guardrails with toeboards on all exposed sides except at entrance to the opening.

F. The opening through the railing shall have either a swinging gate or equivalent protection, or the passageway to the opening shall be so offset that a person cannot walk directly into the opening.

G. An exception includes ladder openings for entrance/access at perimeter roof edges where guardrail protection is not required.

H. The uppermost surface or railing member of the swinging gate or other equivalent protection shall have a vertical height from the platform or floor level of between 42 to 45 inches plus or minus one inch.

I. The swinging gate or other equivalent protection shall be capable of withstanding a force of at least 200 pounds applied vertically downward to the uppermost surface or railing member and horizontally outward at any point on the exit side of the ladder opening.

J. Hatchways and chute floor openings shall be guarded by guardrails or by hinged or removable covers or by removable railings provided such covers or railings will afford protection equivalent to that provided by a guardrail. This does not apply to chute openings which are effectively covered or protected by machine or equipment during operation. However, chutes shall be covered during repair or maintenance or when otherwise exposing employees to the hazards of unguarded floor openings.

K. Foundry pits and similar sunken locations in which employees are required to work may be left unprotected during such times as the necessary handling of materials or other work prohibits the use of guardrails or equivalent; but when such pits are not in use they shall be either covered, filled in, or protected with guardrails or equivalent.

L. Floor holes through which materials or tools may fall and create a hazard or through which parts of a person's body may contact dangerous moving parts, shall be completely covered except when in use unless these floor holes are used to feed machines or receptacles containing hot, toxic or corrosive materials, then these openings shall be guarded by hoppers, guardrails, or grates having openings not exceeding 1-inch by 5 inches.

M. Floor holes through which transmission equipment passes may be guarded by toeboards.

N. Floor and roof opening covers shall be designed by a qualified person and be capable of safely supporting the greater of 400 pounds or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time.

O. Covers shall be secured in place to prevent accidental removal or displacement, and shall bear a pressure sensitized, painted, or stenciled sign with legible letters not less than one inch high, stating: “Opening--Do Not Remove.” Markings of chalk or keel shall not be used.

May 2015
P. Covers shall not project more than one inch above the floor level and all edges shall be chamfered to an angle with the horizontal of not over 30 degrees.

Q. All hinges, handles, bolts, or other parts shall set flush with the floor or cover surface.

XVI. Service Pits and Yard Surface Openings

A. Unused portions of service pits and pits not in actual use shall be either covered or protected by guardrails, this may be accomplished by moveable posts or stanchions and chain rails or other guardrails which will provide equivalent protection. See Cal/OSHA regulations for exceptions.

B. Permanent yard surface openings such as pits or sumps shall be guarded.

C. Trench or conduit covers and their supports, when located in plant roadways, shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

D. Manhole covers and their supports, when located in plant roadways, shall comply with local standard highway requirements if any; otherwise, they shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

XVII. Roof Work

A. Guardrails shall be required at locations where there is a routine need for any employee to approach within 6 feet of the edge of the roof. When intermittent work is being done safety belts and lanyards, or an approved fall protection system may be provided in lieu of guardrails.

B. For the purpose of this requirement, routine need means more than four times a year and intermittent work means work not exceeding four times a year.

C. Guardrails shall be provided along the roof edge extending at least 6 feet beyond the areas occupied by persons accessing, servicing or repairing permanently-mounted machinery and/or equipment.

D. Where fall protection systems are used, safety lines and/or lanyards shall be attached to roof tie-backs or equivalent anchorage. Specific requirements are located in CCR Title 8, Section 3291(f). A safe and unobstructed access shall be provided to all roof tie-back locations.

E. See specific requirements in California Code of Regulations Title 8 Section 3212.

XVII. Skylight

A. Any employee approaching within 6 feet of any skylight shall be protected from falling through the skylight or skylight opening by any one of the following methods:

   Skylight screens. The design, construction, and installation of skylight screens shall meet the strength requirements equivalent to that of covers specified for floor and roof openings. They shall also be of such design, construction and mounting that under design loads or impacts, May 2015
they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork, with openings not more than 4 inches by 4 inches or of slatwork with openings not more than 2 inches wide with length unrestricted, or of other material of equal strength and similar configuration.

Guardrails meeting the requirements for guardrails are used.

A personal fall protection system meeting the requirements of fall protection is used.

Covers are installed over the skylights meeting the requirements specified for floor and roof openings.

A fall protection plan is implemented when it can be demonstrated that the use of fall protection methods is impractical or creates a greater hazard.

B. Exception: When the work is of short duration and limited exposure such as measuring, roof inspection, electrical/mechanical equipment inspection, etc., and the time involved in rigging and installing the safety devices equal or exceed the performance of the designated tasks of measuring, roof inspection, electrical/mechanical equipment inspection, etc.; these provisions may be temporarily suspended provided that adequate risk control is recognized and maintained.

C. See specific requirements in California Code of Regulations Title 8, Section 3212.

XIX. Glazed Surfaces

A. Access shall not be permitted on glazed surfaces such as roofs, vaults, canopies, or skylights glazed with transparent or translucent materials unless an engineer currently registered in the State of California and experienced in the design of such glazed structures has certified that the surface will support all anticipated loads.

B. Employees working on such surfaces shall be protected by a fall protection system.

C. When glazed surfaces cannot be safely accessed for maintenance scaffolds, catwalks, rolling ladders, platforms or other methods of safe access shall be provided.

D. See specific requirements in California Code of Regulations Title 8, Section 3212.

XX. Ladders, Aerial Lifts, and Scaffolds

A. This written program does not address specific requirements pertaining to ladders, aerial lifts, and scaffolds. See applicable programs and Cal/OSHA regulations.

B. Employees who work on ladders must be knowledgeable about safety information including but not limited to:

How to inspect ladders to ensure ladder is in safe working order.

May 2015
How to use ladders properly.

C. Employees who use aerial lifts must be knowledgeable about safety information including but not limited to:

- The manufacturer’s operating instructions.
- Pre-start inspection of the lift.
- Inspection of the work area for dangerous conditions such as uneven surfaces, overhead obstructions such as power lines, or other hazards.
- Load capacities of the equipment.
- How to safely move the equipment.
- How to prevent falls and use appropriate fall protection personal protective equipment.
- Minimum safe approach distances to energized power lines.

D. Employees who work on scaffolds must be knowledgeable about safety information including but not limited to:

- The possibilities of electrical hazards, fall hazards, and falling object hazards in the work area.
- The correct procedure for erecting, securing, maintaining and disassembling the fall protective systems and falling object protection systems used.
- The proper use/construction of the scaffold.
- The proper handling of materials on the scaffold.
- The maximum load and carrying capacities of the scaffolds.

XXI. PROGRAM AUDITS AND RECORD KEEPING

A. The following requirements apply to maintenance of Fall Protection Program records:

- Equipment inspection and training records shall be maintained for a minimum of three years.

- Training records shall include sign in sheets with each employee’s name and date of the training.
Training records and equipment inspection records shall be maintained by the department or EH&S and shall be available in the applicable department for inspection by employees and their authorized representatives.

This written program shall be available for all employees to review.

All records shall be provided upon request to employees, former employees, and representatives of employees.

EH&S shall work with applicable Department Managers and Supervisors to review and update written procedures in this program.

See, Attachment 1 - Inspecting, Cleaning and Storing Fall Protection Equipment [PDF]