Section 7: Fall Prevention and Protection

Purpose

To establish practice relative to the scope and use of fall protection systems to affected employees. This program shall establish a means to analyze elevated work tasks and determine appropriate personal protection against elevated hazards. All employees must receive documented training, and retraining as necessary, to recognize and eliminate fall hazards. It is the expectation that all affected employees will follow and comply with the OSHA standard and this program. If applicable, a site-specific plan will be developed by a qualified person.

Responsibility

1. Management shall be responsible for the implementation and enforcement of the "Fall Prevention and Protection Program."

2. The safety department shall have full authority to ensure enforcement of the program. Its primary responsibility will be to support operations and to monitor the program for compliance. The safety department will act as advisors to management.

3. Field management (foremen) shall be responsible for supporting and enforcing this program to ensure 100% compliance by all personnel.

Procedures

1. Fall protection equipment shall meet the requirements of all applicable ANSI, ASTM or OSHA requirements.

2. All personnel in elevated work situations 6 feet or greater will be required to wear an approved personal fall arrest system.

3. Any situation in which an employee is above ground level 6 feet or greater without permanent handrail or midrail protection is considered elevated work and shall follow OSHA Subpart M 1926.500 - Fall Protection.

4. Maximum use of primary fall protection systems will be implemented. These include scaffolds, aerial lifts, personnel hoists, etc. These systems shall be equipped with complete working / walking surfaces free of unprotected floor openings, complete with guardrail systems, toe boards, and safe means of access.

5. Personnel traveling or working in elevated areas where a fall exposure exists shall make use of secondary fall protection by securing their safety lanyard at all times to a structure, lifeline, or approved fall arresting device capable of supporting 5,000 pounds. To ensure this, all personnel

shall use either the "Y" design lanyard with shock absorbing device or two straight lanyards with shock absorbing device. One end of the "Y" or straight lanyard shall be secured at all times providing 100% fall protection.

6. Personnel working from or traveling in aerial lifts or personnel lifting devices shall properly secure their lanyard to that device.

7. All fall protection devices are to be inspected on a daily basis before use for damage and/or deterioration. Defective equipment shall be removed from service and either destroyed or repaired. All devices are to undergo a documented inspection and will be factory inspected per manufacturer's recommendations. No alterations are allowed.

8. Fall protection devices subjected to shock loading imposed during fall arrest shall be removed from service and the safety department shall be notified immediately.

9. Fall protection devices and systems shall not be used for any other than employee safeguarding.

10. All personnel who will be subjected to elevated work situations are required to attend a class on fall prevention which must meet OSHA 1926.503 (2) and is presented by the safety department or the designated competent person on site.

11. Any employee subjected to a fall shall be promptly rescued.

12. Subcontractors shall comply with the requirements set forth in this program as a minimum for fall protection.

Fall Protection Devices

1. Primary Fall Protection Systems

These systems provide walking and working surfaces in elevated areas which are free from floor openings and are equipped with standard guardrail systems on all open sides and closure apparatus for ladder openings or other points of access. These systems include, but are not limited to, scaffolds, aerial lifts, and other approved personnel hoisting devices.

a. Standard guardrails will consist of top rail material approximately 42 inches above the walking/working surface. In addition, a midrail of the same material will be installed at a height of approximately 21 inches above the surface. A 3 1/2" minimum tall toe board shall be installed at the walking / working surface. The upright support post spacing shall not exceed 8 feet and the entire system must be capable of supporting 200 pounds force in any direction with minimum deflection.

b. Hole covers are to be used to close openings and holes in floors, platforms, and

walkways. These covers must be capable of supporting without failure at least twice the weight of employees, equipment, and materials. In lieu of floor covers, guardrail systems and/or other means of secondary fall protection (i.e. lifelines) shall be erected. Where covers are utilized, the cover must completely cover the opening/hole, be secured against accidental displacement, and must be marked as follows: "HOLE or COVER."

2. Personal Fall Arrest Systems

a. These systems shall be worn and used as backup to primary fall protection systems and in the absence of primary fall protection systems.

b. Only harnesses, belts, and lanyards furnished by the company will be used. Personal systems will not be used.

c. Subcontractors shall provide appropriate fall protection equipment to their employees.

d. Lanyards must be the shock absorbing type.

e. The shock absorber end of the lanyard shall be attached to the D-ring located on the middle back of the harness.

f. D-rings on the waist of the harness may only be used for positioning and with rail type ladder climbing devices. Only approved work positioning lanyards will be used for positioning; a shock absorbing lanyard must also be secured in this event.

g. The "Y" type shock absorbing lanyard shall only be used with the full body harness.

h. All lanyards shall have the double locking-type snaps to prevent roll out, and shall have a minimum tensile strength of 5,000 pounds.

3. Warning Lines

a. Warning lines are points of attachment for fall protection and must be capable of supporting at least 5,000 pounds impact loading. Warning lines may be mounted either vertically or horizontally and are intended to provide mobility with fall protection to personnel working in elevated areas.

b. Horizontal warning lines must be made to support and withstand at least 5,000 pound impact. Alternate materials for specific cases must be approved by the safety department.

c. Cable clamps shall be of the appropriate size for the diameter of cable being used and there shall be a minimum of three clamps at each termination end for cable up to 7/16" in diameter. For 1/2" to 3/4" diameter cable, four cable clamps shall be utilized. For cable requirements larger than 3/4", the safety department shall be consulted.

d. Cable clamps are to be installed with saddle on the "live" side of the cable.

e. Horizontal warning lines shall be positioned to provide points of attachment at waist level or higher to the personnel utilizing them.

f. Warning lines shall not be used for any purpose other than fall protection.
g. Horizontal warning lines shall be installed and maintained by a competent person as described in OSHA 1926.503 (2).

h. Warning lines shall be flagged at not more than 6 foot intervals with high visibility material.

i. Vertical warning lines are used for personnel fall protection where vertical mobility is required. They may be comprised of static lifelines made of synthetic fiber rope or cable which is equipped with approved rope grabs, or they may consist of self-retracting reel type lanyard / lifelines which are attached to a safety harness.

j. Static rope grabs are required for personnel working from spyder/sky climbers, two point supervision scaffolds, or boatswain chairs. These types of lifelines can also be used to provide fall protection for other operations such as scaffold erection and structural steel erection where tie off points are limited and vertical mobility, if required.

k. Cable clamps for lifelines shall be painted to identify them as being for lifeline use only.

Other Devices

Safety Nets

Safety nets shall be installed as close as practicable under the walking / working surface on which employees are working, but in no case more than 30 feet below such level.

Lifeline Placement / Installation

1. Horizontal Lifelines
   a. Horizontal lifelines placed in skeletal steel structures shall be at least 1/2" cable and secured on each end by at least three cable clamps of proper size. Intermediate supports shall be adequate to minimize sag and vertical deflection.

   b. Priority shall be given to lifeline placement as structures are erected.

   c. Lifelines shall be arranged to provide adequate mobility in all areas of the structure while maintaining 100% fall protection for personnel.

d. Personnel installing lifelines shall be protected from falls at all times by use of retractable lifelines or tie off to structural steel, etc.

e. Softeners shall be used where lifelines contact sharp edges such as beam flanges. Softeners shall be secured in place to prevent accidental displacement.

2. Vertical Lifelines/Retractable Lifelines

a. Static rope lifelines shall be made of synthetic fiber rope and will be inspected prior to each use.

b. Static rope lifelines must be used with approved rope grabs for lanyard attachment.

c. Static rope lifelines must be anchored at the top by means capable of supporting 5,000 pounds impact loading.

d. Static rope lifelines/rope grabs will be placed for each person working from or riding in spyder/sky climbers, two point suspension scaffolds, or boatswain chairs. Each person must have an individual lifeline, and the attachment point of the body harness shall be located in the center of the wearer's back.

3. Retractable Reel Lifelines

a. Retractable lifeline devices shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device in the fully extended position.

b. Retractable lifeline devices shall be secured by means of carabineers, shackles, and wire rope or synthetic slings. Tie wire, synthetic, or natural rope shall not be used to secure these devices.

c. Each retractable lifeline shall be equipped with a rope tag line for extending the device to elevations below the point of attachment.

Other Applications

1. Ladders

Requirements under OSHA 1926 Subpart X must be followed.

2. Temporary Work Platforms/Walkways

Scaffolds

a. All temporary platforms/walkways are to be equipped with solid decks free of openings and shall be equipped with a standard guardrail system.

b. Personnel working from temporary platforms or traveling on temporary catwalks shall have their safety lanyards secured at all times to a lifeline or structure capable of supporting 5,000 pounds impact loading.

c. Every temporary work platform or walkway must be provided with a safe means of access/egress which allows personnel to remain tied off at all times. Retractable lifelines shall be used to achieve fall protection while ascending access ladders to temporary work platforms or walkways.

3. Aerial Lifts

Personnel riding in or working from these lifts must secure the lanyard to the lift basket at all times.

4. Spyder/Sky Climbers and Boatswain Chairs

Personnel riding in, or working from, these hoisting devices shall each be provided with an independent lifeline and rope grab to the lanyard and shall be secured at all times while aloft.

5. Crane Hoisted Personnel Baskets

Personnel riding in or working from personnel baskets must have the lanyard secured to the basket at all times when aloft.

6. Skeletal Steel/Open Structures

This section deals with fall protection when personnel are required to gain access to travel and work in skeletal steel/open structures such as transmission towers. This includes traveling on or working on any elevated surface which is not designed as a personnel work surface or walkway.

a. Personnel working or traveling in elevated skeletal/open structures shall secure their lanyards to a lifeline or structure capable of supporting 5,000 pounds impact loading at all times. This includes both horizontal and vertical travel.

b. Adequate lifeline systems will be erected when feasible in skeletal steel/open structures to allow 100% fall protection for personnel working or traveling in these structures.

c. In lieu of lifelines, personnel may secure safety lanyards to substantial structural steel members, pipe, and pipe supports.

7. Permanent Structures/Stairs/Caged Ladders

a. All employees and subcontractor personnel are required to wear an approved full body harness with shock absorbing lanyards. If personnel do not venture outside the enclosed area of a completed permanent structure, then full body harness is not required.

b. When personnel are working or traveling in incomplete permanent structures where fall exposure exists, then they must be properly tied off when within 6 feet of any fall exposure, or a proper guardrail restraint system must be in place.

c. Priority shall be given to installation and securing of permanent floors and walking surfaces and all guardrails or other permanent fall protection devices.

d. Permanent stairs, when completed, shall be used to access or egress elevated work areas.

8. Structural Steel Erection

a. Personnel erecting structural steel shall achieve 100% fall protection through use of safety harnesses/lanyards, retractable lifelines, aerial lifts, and guardrail systems.

b. Access to structural steel shall be obtained by use of ladders, aerial lifts, or other approved personnel hoisting devices. Climbing of structural steel members such as columns and diagonal braces shall be allowed.

c. Prior to and during horizontal lifeline placement structural personnel shall crawl steel members with lanyards tied around these members. Retractable lifelines secured at elevations above the point of operation may be used in some applications to provide fall protection prior to the availability of horizontal lifelines.

d. When lanyard lengths longer than 6 feet are required due to large steel members, the safety department shall be contacted to assess methods for the additional length needed.

Inspection and Maintenance

1. Full Body Harnesses and Safety Belt Inspection

a. Belts and harness straps should be inspected by beginning at one end, holding the body side of the belt toward you, grasp the strap with your hands 6 to 8 inches apart. Bend the harness strap in an inverted “U”. The surface tension resulting makes damaged fibers or cuts easier to see. Follow this process the entire length of the harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, or chemical damage.

b. Check the D-rings and D-ring metal wear for distortion, cracks, and rough sharp edges. The D-ring bar should be at a 90 degree angle with the long axis of the belt and should

pivot freely.

c. Attachment of buckles and D-rings need special attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles or D's. Rivets should be tight and unmovable with fingers. Body side rivet base and outside burr should be flat against the material.
d. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface. Any broken, cut or burned stitches will be seen.

e. The tongue or billet of the belts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Belts should never have additional punched holes.

f. Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on the frame. Check for distortion or sharp edges.

g. Friction buckles shall be inspected for distortion. The outer bars and center bars must be straight. Special attention should be given to the corners and attachment points of the center bar.

2. Lanyard Inspection

When inspecting lanyards, begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked. Spliced ends require extra attention.

a. The double locking snaps should be inspected closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.

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

c. While bending a web lanyard over a pipe or mandrel, observe each side of the webbing. This will reveal any cuts or breaks. Swelling, discoloration, cracks, charring are obvious signs of chemical or heat damage.

d. Rotation of the rope lanyard while inspecting from end-to-end will reveal any fuzzy, worn, broken, or cut fibers. Weakened areas from extreme loads will appear as a noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period.

e. Shock absorption devices should be examined for burn holes and tears of the outer portion. Stitching on areas where the pack is sewn to the D-rings, belts, or lanyards should be examined for loose strands, rips, and deterioration.

Rescue Plan / Investigations

A Rescue Plan is in place if an incident occurs where an employee is either suspended in a harness from a fall or if stranded in an aerial platform due to a mechanical failure or personal incapacitation. Rescue will be performed by trained co-workers to operate emergency lower controls on the equipment to facilitate a rescue. High Angle Rescue services will be arranged as needed on specific sites.

Accident or incident investigations will be conducted in the event of a fall, near-miss, or other significant occurrence.

Cleaning and Storage

Wipe off all surface dirt with a sponge dampened in plain water. Water and a mild commercial soap can be used for tougher dirt. Wipe dry and hang freely; store in a clean, dry location without direct sunlight or excessive heat.