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## Elevated Work & Fall Protection

## ELEVATED WORK & FALL PROTECTION

### LADDER SAFETY

Slips and falls are the leading cause of deaths in and around the home and workplace, killing more than 6,000 people a year. Many more people are disabled in similar mishaps. A major subset of these mishaps involves ladders, which are involved in more than 30,000 injuries per year. Although ladders appear simple, there are rules to follow when using them.

1. Use the right kind of ladder for your task, and make sure it complies with specifications of the American National Standards Institute (ANSI) and that it is listed by Underwriters Laboratories (UL). Read and follow the manufacturer's instructions on the label attached to the ladder.
2. Make sure your ladder is tall (or long) enough. For stepladders, **obey the "not a step" markings on the top steps and the shelf.**
3. **Check over your ladder before you trust it.** Looks for damaged rungs, steps, hinges and braces. If damaged, repair it or replace it. Antiques are nice, but not when it comes to ladders.
4. Make sure you can **lock the spreaders** on stepladders in place.
5. Extension ladders should have "safety feet" that **stabilize the ladder** and keep it from slipping.
6. Set your ladder on **a solid surface and keep it level.**
7. **Open stepladders fully.**
8. When using a straight ladder, the base should be **one foot away from the vertical surface for every four feet of height** (to the point when the top of the ladder will rest).
9. If you're climbing onto your roof or a platform, make sure the ladder extends above the edge at **least three feet.**
10. Never lean a ladder against an unstable surface, such as a tree limb.
11. Always **face the ladder when climbing.** Carry tools in a tool belt or a bucket that you can raise and lower with a rope from the ladder.
12. Make sure your shoes aren't slippery.
13. You can put non-skid on the rungs of an aluminum ladder.
14. Hold on with one hand while working on a ladder. Don't reach too far to the sides or behind you.
15. **Don't climb higher than the second step from the top on a stepladder** or the third from the top on a straight ladder.
16. Only one person should be on the ladder at a time.
17. Tables, boxes, and chairs aren't ladders.
18. Don't put ladders on barrels, boxes, concrete blocks or other unstable bases.

### FALL PROTECTION

#### PURPOSE

To establish guidelines to prevent employees from sustaining serious injury if they fall on the job.

#### POLICY

OSHA has revised its construction industry safety standards for fall protection requirements (Codes 1926.5, 1926.501, 1926.502, and 1926.503) and has developed systems and procedures designed to prevent employees from falling off, onto, or through working levels and to protect them from being struck by falling objects. These policies cover all construction workers except those inspecting, investigating, or assessing workplace conditions prior to the actual start of work or after all work has been completed.

These policies identify areas where fall protection is needed. These areas include ramps, runways, walkways, excavations, hoist areas, holes, formwork and reinforcing steel, leading edge work, unprotected sides and edges, overhand bricklaying, roofing, pre-cast concrete erection, wall openings, and residential construction. These policies set a uniform threshold height of 6 feet, thereby providing consistent protection. This means that the company must protect employees from fall hazards and falling objects whenever an employee is 6 feet or more above a lower level.

Under these new standards, management will have the flexibility to select fall protection measures compatible with the type of work being performed. Fall protection generally can be provided through the use of guardrails, safety nets, personal fall arrest systems, positioning device systems, and warning line systems.

## **DUTY TO HAVE FALL PROTECTION**

The Company is required to assess all new job-sites prior to any work being performed to determine if the walking/working surfaces have the strength to safely support workers. Employees are not permitted to work on any new surfaces until those surfaces are determined to be safe. Once the Safety Director determines that the surface is safe, the Safety Director must select one of the options previously listed for the work operation if a fall hazard is present (guardrails, safety nets, etc.).

## **CONTROLLED ACCESS ZONES**

A controlled access zone is a work area designated and clearly marked in which certain types of work may take place without the use of conventional fall protection systems to protect the employees working in the zone. These are used to keep out workers other than those authorized to enter work areas from which guardrails have been removed. Where there are no guardrails, masons are the only workers allowed in controlled access zones.

Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line or by any other means that restricts access. Control lines should consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions. Each must be:

- Flagged or clearly marked at not more than 6 foot intervals with high-visibility material;
- Supported so that the lowest point is not less than 39 inches from the walking/working surface and the highest point is not more than 45 inches from the walking/working surface;
- Strong enough to sustain stress of at least 200 pounds. Control lines should extend along the entire length of the unprotected or leading edge and should be parallel to this edge; and
- Control lines also must be connected on each side to a guardrail system or wall.

When control lines are used, they should be erected not less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when precast concrete members are being erected. With pre-cast concrete member erection, the control line should be at least 6 feet but less than 60 feet from the leading edge.

Controlled access zones, when used to determine access to areas where overhead bricklaying and related work are taking place, are to be defined by a control line erected at least 10 feet but not more than 15 feet from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone. Only employees engaged in overhand bricklaying or related work are permitted in the controlled access zones.

On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones will be enlarged as necessary to enclose all points of access, material handling areas, and storage areas. On floors and roofs where guardrail systems are in

place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work should be removed.

## **EXCAVATIONS**

Each employee at the edge of excavation 6 feet or more deep should be protected from falling by a guardrail system, fence, barricade, or cover. Where walkways are provided to permit employees to cross over excavations, guardrails are required on the walkway if it is 6 feet or more above the excavation.

## **HOIST AREAS**

Each employee in a hoist area should be protected from falling 6 feet or more by guardrail systems or personal fall arrest systems. If guardrail systems must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.

## **LEADING EDGES**

Employees constructing a leading edge 6 feet or more above lower levels should be protected by guardrail systems, safety net systems, or personal fall arrest systems. If the Safety Director can demonstrate that it is infeasible or creates a greater hazard to implement these systems, he or she must develop and implement a fall protection plan that meets the requirements of 29 CFR 1926.502(k).

## **ROOFING**

Low-Slope Roofs- Employees engaged in roofing activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels should be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted.

Steep Roofs- Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels should be protected by a guardrail system with toeboards, safety net systems, or personal fall arrest systems.

## **FALL PROTECTION SYSTEMS CRITERIA AND PRACTICES**

Guardrail Systems must meet the following criteria:

Top-rails and mid-rails must be at least one-quarter inch thick to prevent cuts and lacerations.

- If wire rope is used for top-rails, it must be flagged at not more than 6 foot intervals with high visibility materials.
- Steel or plastic binding cannot be used as top-rails or mid-rails.
- The top edge height of top-rails or guardrails must be 42 inches plus or minus 3 inches above the walking/working level.
- When workers are using stilts, the top edge height of the top-rail, or equivalent member, must be increased by an amount equal to the height of the stilts.
- Screens, mid-rails, mesh, intermediate vertical members, or equivalent intermediate structural members must be installed between the top edge of the guardrail system and the walking/working surface when there are no walls at least 21 inches high.
- When mid-rails are used, they must be installed at a height midway between the top edge of the guardrail system and the walking/working level.
- When screens and mesh are used, they must extend from the top rail to the walking/working level and along the entire opening between top rail supports.

- Intermediate members, such as balusters, when used between posts, should not be more than 19 inches apart.
- Other structural members should be installed so that there are no openings in the guardrail system more than 19 inches.
- The guardrail system must be capable of withstanding a force of at least 200 pounds applied in any outward or downward direction.
- Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members should be capable of withstanding a force at least 150 pounds applied in any downward or outward direction at any point along the mid-rail or other member.
- Guardrail systems should be surfaced to protect workers from punctures or lacerations and to prevent clothing from snagging.
- The ends of top-rails and mid-rails must not overhang terminal posts, except where such overhang does not constitute a projection hazard.
- When guardrail systems are used at hoisting areas, a chain or gate must be placed across the access opening between guardrail sections when hoisting operations are not taking place.

### Personal Fall Arrest Systems

These consist of an anchorage, connectors, and a body belt or harness and may include a decelerator device, lifeline or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

- a) Limit maximum arresting force on an employee to 900 pounds when used with a body belt, or 1,800 pounds when used with a body harness;
- b) Be rigged so that an employee cannot free fall more than 6 feet or contact any lower ..... level;
- c) Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet;
- d) Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance 6 feet or the free fall distance permitted by the system, whichever is less.

Effective January 1, 1998, the use of a body belt for fall arrest is prohibited and the following precautions must be taken:

- Personal fall arrest systems must be inspected prior to each use for wear damage and other deterioration. Defective components must be removed from service. Dee-rings and snaphooks must have a minimum tensile strength of 5,000 pounds. Dee-rings and snaphooks should be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or suffering permanent deformation.
- Snaphooks should be sized to be compatible with its connecting member or should be of a locking configuration. Unless the snaphook is a locking type and designed for the following connections, they shall not be engaged (a) directly to webbing, rope or wire rope; (b) to each other; (c) to a dee-ring to which another snaphook or other connector is attached; (d) to a horizontal lifeline; or (e) to any object incompatible in shape or dimension relative to the snaphook, thereby causing the connected object to depress the snaphook keeper and release unintentionally.
- On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline should be capable of locking in both directions on the lifeline. Horizontal lifelines should be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall arrest system that maintains a safety factor of at least two. Lifelines should be protected against being cut or abraded.
- Self-retracting lifelines and lanyards that 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 that don't limit free fall distance to 2 feet or less, ripstitch lanyards, and tearing and deforming lanyards should 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. Ropes and straps used in lanyards, lifelines, and strength components of body belts and body harnesses should be made of synthetic fibers.

- Anchorages should be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall arrest system that maintains a safety factor of at least two. Anchorages used to attach personal fall arrest systems should be independent of any anchorage being used to support or suspend platforms and must be capable of supporting at least 5,000 pounds per person attached. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.

### Positioning Device Systems

These body belt or body harness systems should be set up so that a worker can free fall no farther than 2 feet. They should be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater. Requirements for snaphooks, dee-rings, and other connectors used with a positioning device must meet the same criteria as those for personal fall arrest systems.

### Safety Monitoring Systems

When no other alternative fall protection has been implemented, the Safety Director should implement a safety monitoring system. Employers must appoint a competent person to monitor the safety of workers and the Safety Director must ensure that the safety monitor:

- Is competent in the recognition of fall hazards;
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices;
- Is operating on the same walking/working surfaces of the workers and can see them;
- Is close enough to communicate with workers and has no other duties to distract from the monitoring function.

### Safety Net Systems

The following precautions must be taken when using a safety net system:

- Safety nets must be installed as close as possible under the walking/working surface on which employees are working and never more than 30 feet below such levels.
- Safety nets should be inspected at least once a week for wear, damage, and other deterioration.
- The maximum size of each safety net mesh opening should not exceed 36 square inches or be longer than 6 inches on any side.
- The openings, measured center-to-center, should not exceed 6 inches.
- All mesh crossings should be secured to prevent enlargement of the mesh opening. Each safety net or section should have a border rope for webbing with a minimum breaking strength of 5,000 pounds.
- Connections between safety net panels should be as strong as integral net components and be spaced no more than 6 inches apart.
- Safety nets should be installed with sufficient clearance underneath to prevent contact with the surface or structure below.
- When nets are used on bridges, the potential fall area from the walking/working surface to the net should be unobstructed.
- Items that have fallen into safety nets must be removed as soon as possible or before the next work shift.
- Safety nets should extend outward from the outermost projection of the work surface as follows:

<b>Vertical distance from working level to horizontal plane of net.</b>	<b>Minimum required horizontal distance of outer edge of net from the edge of the working surface.</b>
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

### Warning Line Systems

Warning line systems consist of ropes, wires, or chains, and should be set up as follows:

- Flagged at no more than 6-foot intervals with high-visibility material;
- Rigged and supported so that the lowest point (including sag) is no less than 34 inches from the walking/working surface and its highest point and is no more than 39 inches from the walking/working surface;
- The rope, wire, or chain should have a minimum tensile strength of 500 pounds and after being attached to the stanchions must support the load applied to the stanchions (upright post or support);
- Should be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines should be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line should be erected no less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and no less than 10 feet from the edge perpendicular to the direction of mechanical equipment operation. When mechanical equipment is not being used, the warning line must be erected no less than 6 feet from the roof edge.

### Toeboards

The following precautions and procedures must be followed when using toeboards:

- When toeboards are used as protection from falling objects, they must be erected along the edges of the overhead walking/working surface for a distance sufficient to protect persons working below.
- Toeboards should be capable of withstanding a force of at least 50 pounds applied in any downward or outward direction at any point along the toeboard.
- Toeboards should be a minimum of 3.5 inches tall from their top edge to the level of the walking/working surface, have no more than .25 inches clearance above the walking/working surface, and be solid or have openings no large than one inch in size.
- When tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening must be erected from the walking/working surface or toeboard to the top of a guardrail system's top-rail or mid-rail for a distance sufficient to protect employees below.

## **SCAFFOLDING SAFETY PROCEDURES FOR CONSTRUCTION**

### **PURPOSE**

It is this company's purpose in issuing these procedures to further ensure a safe workplace based on the following formal, written procedures for scaffold work. These procedures will be reviewed and updated as needed to comply with new OSHA regulations, new best practices in scaffolding, and as business practices demand.

### **GENERAL PROCEDURES**

The following general procedures apply to all scaffold and aerial lift operations for Gordon H. Bayer, Inc.

## **CAPACITY**

Taking into account the OSHA rules we must apply and the engineering/manufacturing requirements of our scaffolds, the following rules apply.

- \* Each scaffold and scaffold component we use will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.

## **PLATFORM CONSTRUCTION**

This section documents the procedures and safety requirements we use to construct our scaffold platforms.

The following safety rules apply for this tubular scaffold platform construction:

- \* Each scaffold plank will be installed so that the space between adjacent planks and the space between the platform and uprights is no more than one inch wide. If, in certain situations, we need to make this space wider, we will make appropriate provisions.
- \* Except for outrigger scaffolds (3 inches) and plastering and lathing operations (18 inches), the front edge of all platforms will not be more than 14 inches from the face of the work, unless we have a guardrail or personal fall arrest system in place that meets regulations.
- \* Supported scaffolds with a height to base width ratio of more than four to one (4:1) must be restrained from tipping by guying, tying, bracing, or equivalent means. Manufacturer's recommendations should be followed.
- \* Supported scaffold poles, legs, posts, frames, and uprights will always bear on base plates and mud sills or other adequate firm foundations.
- \* Each scaffold platform and walkway must be at least 18 inches wide. If less than 18 inches wide, guardrails or other means of fall protection must be utilized.
- \* All scaffold must be at least 20' from live electrical power lines.

## **GAINING ACCESS TO SCAFFOLDS**

We know that getting to the working platform is critical to the safety of our employees. This section outlines the mechanical requirements for gaining access to scaffold platforms such as: (1) ladders, (2) ramps and walkways, (3) stair rails, and (4) direct access from another scaffold. This section is divided into two parts. The first part is for workers gaining access to scaffold platforms to do work; the second part is access for employees erecting and dismantling scaffolds.

### *Working Employees:*

- \* Portable, hook-on, and attachable ladders will be positioned so as not to tip the scaffold.
- \* All stair rail systems and handrails will be surfaced to prevent injury to our employees from punctures or lacerations, and to prevent snagging of their clothes.

### *Erectors and Dismantlers:*

Our company shall provide safe means of access for each employee erecting or dismantling a scaffold where the provision of safe access is feasible and does not create a greater hazard. We shall have a competent person determine whether it is feasible or would pose a greater hazard to provide, and have employees use a safe means of access. This determination shall be based on site conditions and the type of scaffold being erected or dismantled.

Hook-on or attachable ladders shall be installed as soon as scaffold erection has progressed to a point that permits safe installation and use.



When erecting or dismantling tubular welded frame scaffolds, (end) frames, with horizontal members that are parallel, level and are not more than 22 inches apart vertically may be used as climbing devices for access, provided they are erected in a manner that creates a usable ladder and provides good hand hold and foot space.

Cross braces on tubular welded frame scaffolds shall not be used as a means of access or egress.

### **FALL PROTECTION PLAN**

Fall protection planning is critical to the safety and wellbeing of our employees. Our fall protection plan follows the OSHA requirements that are different depending on the type of scaffold we are using.

This fall protection plan for our working employees is for the following type(s) of scaffold(s):

- \* Tubular Scaffold

All scaffold will have guardrails on all sides when the fall distance is 10' or greater. The guardrail system:

- \* Must be between 38 and 45 inches in height above the work platform
- \* Cross bracing can be used as a top rail, if between 38 and 48 inches in height
- \* Has a minimum 200-pound top rail capacity.
- \* Will have a mid-rail with a 150-pound rail capacity.
- \* Will be installed before being released for use by our employees.
- \* Employees are prohibited from working on scaffold covered with snow, ice or other slippery materials, except to remove these substances.

### **FALLING OBJECT PROTECTION**

All employees must wear hardhats when working on, around, assembling, or dismantling scaffolds. This is our primary protection from falling objects. Additionally, we will:

- \* Install all planking with openings small enough to prevent passage of potential falling objects.
- \* Prevent tools, materials, or equipment that inadvertently fell from our scaffolds from striking employees by barricading the area below the scaffold.
- \* Provide toe boards on scaffold planks above working surfaces

### **USING SCAFFOLDS**

Site preparation, scaffold erection, fall protection, and gaining access to the working platform are only some of the requirements for scaffold work. While this all takes concentration and safe work practices, the most dangerous time can be when employees are concentrating on their work and not particularly aware of the hazards of working from scaffolds. It is critical that employees who use scaffolds be trained, among other things, in the recognition of the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. Our competent person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence that could affect a scaffold's structural integrity. However, in addition to that, all users of scaffolds in this company will know and understand the following safety rules:

- \* Scaffolds and scaffold components will never be loaded in excess of their maximum intended loads or rated capacities.
- \* Materials are to be placed over cross braces for additional stability
- \* Debris must not be allowed to accumulate on platforms, and all materials should be removed from the scaffold nightly.

- \* All scaffold must be inspected before use, daily and after events (such as storms) that might affect stability.

## **PROHIBITED PRACTICES**

The following practices will never be tolerated in this company:

- \* Scaffold components manufactured by different manufacturers will never be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained.
- \* Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement, according to the soil type.
- \* Cross braces will never be used as a means of access.
- \* The use of shore or lean-to scaffolds is prohibited.

## **TRAINING**

Recognizing the need for training for employees who: (1) perform work while on scaffolds, (2) are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds, and (3) have lost the requisite proficiency, the following training syllabus is a part of this written safety plan.

### *Employees Who Use Scaffolds:*

Our employees who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training will include the following areas as applicable:

- \* The nature of and the correct procedures for dealing with electrical hazards.
- \* The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
- \* The proper use of the scaffold, and the proper handling of materials on the scaffold.
- \* The maximum intended load and the load-carrying capacities of the scaffolds used.
- \* Any other pertinent requirements of the OSHA rules.

### *Employees Who Erect, Disassemble, Move, Operate, Repair, Maintain, or Inspect Scaffolds:*

Our employees who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds will be trained by our competent person to recognize the hazards associated with the work being done. The training will include the following topics as applicable:

- \* The nature of scaffold hazards.
- \* The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
- \* The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
- \* Any other pertinent requirements of this subpart.

### *Employees Who Need Retraining:*

When we have reason to believe that one of our employees lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, we will retrain the employee so that the requisite proficiency is regained. Retraining will be done in at least the following situations:

- \* Where changes at the worksite present a hazard about which the employee has not been previously trained.
- \* Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained.
- \* Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.