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# **SBE BUILDERS**

## **1. FALL PROTECTION PLAN**

# **SBE BUILDERS**

## **FALL PROTECTION PLAN**

### **1.1 DUTY TO HAVE FALL PROTECTION**

SBE BUILDERS will determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees will be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

#### Unprotected Sides and Edges

Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8m) or more above a lower level will be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

#### Leading Edges

Each employee who is constructing a leading edge 6 feet (1.8m) or more above the lower levels will be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems. Exception: When SBE BUILDERS can demonstrate that it is infeasible or creates a greater hazard to use these systems, SBE BUILDERS will develop and implement a fall protection plan.

Each employee on a walking/working surface 6 feet (1.8m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, will be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

#### Hoist Areas

Each employee in a hoist area will be protected from falling 6 feet (1.8m) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, (or chain gate, or guardrail) or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee will be protected from fall hazards by a personal fall arrest system.

#### Holes

Each employee on walking/working surfaces will be protected from falling through holes (including skylights) more than 6 feet (1.8m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.

Each employee on a walking/working surface will be protected from tripping in or stepping into or through holes (including skylights) by covers.

Each employee on a walking/working surface will be protected from objects falling through holes (including skylights) by covers.

### Formwork and Reinforcing Steel

Each employee on the face of formwork or reinforcing steel will be protected from falling 6 feet (1.8m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems.

### Ramps, Runways, and Other Walkways

Each employee on ramps, runways, and other walkways will be protected from falling 6 feet (1.8m) or more to lower levels by guardrail systems.

### Excavations

Each employee at the edge of an excavation 6 feet (1.8m) or more in depth will be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier.

Each employee at the edge of a well, pit, shaft, and similar excavation 6 feet (1.8m) or more in depth will be protected from falling by guardrail systems, fences, barricades, or covers.

### Dangerous Equipment

Each employee less than 6 feet (1.8m) above dangerous equipment will be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards.

Each employee 6 feet (1.8m) or more above dangerous equipment will be protected from fall hazards by guardrail systems, personal fall arrest systems, or safety net systems.

### Overhand Bricklaying and Related Work

Each employee performing overhand bricklaying and related work 6 feet (1.8m) or more above lower levels, will be protected from falling by guardrail system, safety net systems, personal fall arrest systems, or will work in a controlled access zone.

Each employee reaching more than 10 inches (25cm) below the level of the walking/working surface on which they are working, will be protected from falling by a guardrail system, safety net system, or personal fall arrest system.

### Roofing Work on Low Slope - Roofs

Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8m) or more above lower levels will be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or on roofs 50-feet (15.25m) or less in width the use of a safety monitoring system alone (i.e., without the warning line system) is permitted.

### Steep Roofs

Each employee on a steep roof with unprotected sides and edges 6 feet (1.8m) or more above lower levels will be protected from falling by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.

### Precast Concrete Erection

Each employee engaged in the erection of precast concrete members ( including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members, who is 6 feet (1.8m) or more above lower levels will be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.

### Residential Construction

Each employee engaged in residential construction activities 6 feet (1.8m) or more above lower levels will be protected by guardrail systems, safety net system, or personal fall arrest system.

### Wall Openings

Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0m) above the walking/working surface, will be protected from falling by the use of a guardrail system, safety net system, or a personal fall arrest system.

### Walking/Working Surface Not Otherwise Addressed

Each employee on a walking/working surface 6 feet (1.8m) or more above lower levels will be protected from falling by a guardrail system, safety net system, or personal fall arrest system.

### Protection From Falling Objects

When an employee is exposed to falling objects, **SBE BUILDERS** will have each employee wear a hard hat and will implement one of the following measures:

- Erect toeboards, screens, or guardrail systems to prevent objects from falling from higher levels
- Erect a canopy structure and keep potential falling objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced
- Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced

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

SBE BUILDERS will provide and install all fall protection systems for an employee before that

employee begins the work that necessitates the fall protection.

### Guardrail Systems

Guardrail systems and their use will comply with the following provisions:

- Top edge height of top rails, or equivalent guardrail system members, will be 42 inches (1.1m) plus or -minus 3 inches (8cm) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this paragraph.
- Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members will be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53cm) high.
- Screens and mesh, when used, will 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, will be not more than 19 inches (48cm) apart.
- Other structural members (such as additional midrails and architectural panels) will be installed such that there are no openings in the guardrail system that are more than 19 inches (.5m) wide.
- Guardrail systems will be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches (5.1cm) of the top edge, in any outward or downward direction, at any point along the top edge.
- When the 200 pound load is applied in a downward direction, the top edge of the guardrail will not deflect to a height less than 39 inches (1.0m) above the walking/working level.
- Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the midrail or other member.
- Guardrail systems will be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- The ends of all top rails and midrails will not overhang the terminal posts, except where such overhand does not constitute a projection hazard.
- Steel banding and plastic banding will not be used as top rails or midrails.
- Top rails and midrails will be at least one-quarter inch (0.6cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it will be flagged at not more than 6-foot intervals with high visibility material.
- When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail

section will be placed across the access opening between guardrail sections when hoisting operations are not taking place.

- When guardrail systems are used at holes, they will be erected on all unprotected sides or edges of the hole.
- When guardrail systems are used around holes used for the passage of materials, the hole will have not more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use, it will be closed over with a cover, or a guardrail system will be provided along all unprotected sides or edges.
- When guardrail systems are used around holes which are used as points of access (such as ladderways), they will be provided with a gate, or be so offset that a person cannot walk directly into the hole.
- Guardrail systems used on ramps and runways will be erected along each unprotected side or edge.
- Manila, plastic or synthetic rope being used for top rails or midrails will be inspected as frequently as necessary to ensure that it continues to meet the strength requirements.

### Safety Net Systems

Safety net systems and their use will comply with the following provisions:

Safety nets will be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net will be unobstructed.

Safety nets will extend outward from the outermost projection of the work surface as follows:

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

Safety nets will be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test.

Safety nets and their installations will be capable of absorbing an impact force equal to that produced by the drop test.

Defective nets will not be used. Safety nets will be inspected at least once a **week** for wear, damage, and other deterioration. Defective components will be removed from service. Safety nets will also be inspected after any occurrence which could affect the integrity of the safety net system.

Materials, scrap pieces, equipment, and tools which have fallen into the safety net will be removed as soon as possible from the net and at least before the next work shift.

The maximum size of each safety net mesh opening will not exceed 36 square inches (230cm<sup>2</sup>) nor be longer than 6 inches (15cm) on any side, and the opening, measured center-to-center of mesh ropes or webbing, will not be longer than 6 inches (15cm). All mesh crossings will be secured to prevent enlargement of the mesh opening.

Each safety net (or section of it) will have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2kN).

Connections between safety net panels will be as strong as integral net components and will be spaced not more than 6 inches (15cm) apart.

### Personal Fall Arrest Systems

Personal fall arrest systems and their use will comply with the provisions set forth below:

Connectors will be drop forged, pressed or formed steel, or made of equivalent materials.

Connectors will have a corrosion-resistant finish, and all surfaces and edges will be smooth to prevent damage to interfacing parts of the system.

Dee-rings and snaphooks will have a minimum tensile strength of 5,000 pounds (22.2kN).

Dee-rings and snaphooks will be proof-tested to a minimum tensile load of 3,600 pounds (16kN) without cracking, breaking, or taking permanent deformation.

Snaphooks will be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or will be locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.

Unless the snaphook is a locking type and designed for the following connections, snaphooks will not be engaged:

- Directly to webbing, rope or wire rope
- To each other
- To a dee-ring to which another snaphook or other connector is attached
- To a horizontal lifeline
- To any object which is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself

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

Horizontal lifelines will 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 will have a minimum breaking strength of 5,000 pounds (22.2kN).

During the construction of elevator shafts, two employees may be attached to the same lifeline in the hoistway, provided both employees are working atop a false car that is equipped with guardrails; the strength of the lifeline is 10,000 pounds (5,000 pounds per employee attached) (44.4kN); and all other criteria specified in this paragraph for lifelines have been met.

Lifelines will be protected against being cut or abraded.

Self-retracting lifelines and lanyards which automatically limit freefall distance to 2feet (0.61m) or less will be capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) 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 (0.61m) or less, ripstitch lanyards, and tearing and deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds (22.2kN) applied to the device with the lifeline or lanyard in the fully extended position.

Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses will be made from synthetic fibers.

Anchorage used for attachment of personal fall arrest equipment will be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2kN) per employee attached, or will be designed, installed, and used as follows:

- 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.

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

- Limit maximum arresting force on an employee to 900 pounds (4kN) when used with a body harness
- Limit maximum arresting force on an employee to 1,800 pounds (8kN) when used with a body harness.

- Be rigged such that an employee can neither free fall more than 6 feet (1.8m), nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07m)
- Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8m), or the free fall distance permitted by the system, whichever is less.

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

Body harnesses, and components will be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

Personal fall arrest systems and components subjected to impact loading will be immediately removed from service and will not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

SBE BUILDERS will provide for prompt rescue of employees in the event of a fall or will assure that employees are able to rescue themselves.

Personal fall arrest systems will be inspected prior to each use for wear, damage and other deterioration, and defective components will be removed from service.

Personal fall arrest systems will not be attached to guardrail systems, nor will they be attached to hoists except as specified.

When a personal fall arrest system is used at hoist areas, it will be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

### Positioning Device Systems

Positioning device systems and their use will conform to the following provisions:

Positioning devices will be rigged such that an employee cannot free fall more than 2 feet (.9m).

Positioning devices will be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3kN), whichever is greater.

Connectors will be drop forged, pressed or formed steel, or made of equivalent materials.

Connectors will have a corrosion-resistant finish, and all surfaces and edges will be smooth to prevent damage to interfacing parts of this system.

Connecting assemblies will have a minimum tensile strength of 5,000 pounds (22.2kN).

Dee-rings and snaphooks will be proof-tested to a minimum tensile load of 3,600 pounds (16kN) without cracking, breaking, or taking permanent deformation.

Snaphooks will be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook by depression of the snaphook keeper by the connected member, or will be a locking type snaphook designed and used to prevent disengagement of the snaphook by the contact of the snaphook keeper by the connected member.

Unless the snaphook is a locking type and designed for the following connections, snaphooks will not be engaged:

- Directly to webbing, rope or wire rope
- To each other
- To a dee-ring to which another snaphook or other connector is attached
- To a horizontal lifeline
- To any object which is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself

Positioning device systems will be inspected prior to each use for wear, damage, and other deterioration, and defective components will be removed from service.

Body belts, harnesses, and components will be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

### Warning Line Systems

Warning line systems and their use will comply with the following provisions:

The warning line will be erected around all sides of the roof work area.

When mechanical equipment is not being used, the warning line will be erected not less than 6 feet (1.8m) from the roof edge.

When the mechanical equipment is being used, the warning line will be erected not less than 6 feet (1.8m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

Points of access, materials handling areas, storage areas, and hoisting areas will be connected to the work area by an access path formed by two warning lines.

When the path to a point of access is not in use, a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, will be placed across the path at the point where the path intersects the warning line erected around the work area, or the path will be offset such that a person cannot walk directly into the work area.

Warning lines will consist of ropes, wires, or chains, and supporting stanchions erected as

follows:

- The rope, wire, or chain will be flagged at not more than 6 foot (1.8m) intervals with high-visibility material
- The rope, wire, or chain will be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (.9m) from the walking/working surface and its highest point is no more than 39 inches (1.0m) from the walking/working surface
- After being erected, with the rope, wire, or chain attached, stanchions will be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches (.8m) above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain will have a minimum tensile strength of 500 pounds (22.2kN), and after being attached to the stanchions, will be capable of supporting, without breaking
- The line will be attached at 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 adjacent sections before the stanchion tips over

No employee will be allowed in the area between a roof edge and a warning line unless the employee is performing roofing work in that area.

Mechanical equipment on roofs will be used or stored only in areas where employees are protected by a warning line system, guardrail system, or personal fall arrest system.

### Controlled Access Zones

Controlled access zones and their use will conform to the following provisions:

When used to control access to areas where leading edge and other operations are taking place the controlled access zone will be defined by a control line or by any other means that restricts access.

When control lines are used, they will be erected not less than 6 feet (1.8m) nor more than 25 feet (7.7m) from the unprotected or leading edge, except when erecting precast concrete members.

When erecting precast concrete members, the control line will be erected not less than 6 feet (1.8m) nor more than 60 feet (18m) or half the length of the member being erected, whichever is less, from the leading edge.

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

The control line will be connected on each side to a guardrail system or wall.

- When used to control access to areas where overhand bricklaying and related work are taking place:

- The controlled access zone will be defined by a control line erected not less than 10 feet (3.1m) nor more than 15 feet (4.5m) from the working edge.
- The control line will extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and will be approximately parallel to the working edge.
- Additional control lines will be erected at each end to enclose the controlled access zone.
- Only employees engaged in overhand bricklaying or related work will be permitted in the controlled access zone.
- Control lines will consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
  - Each line will be flagged or otherwise clearly marked at not more than 6 feet (1.8m) intervals with high-visibility material.
  - Each line will be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1m) from the walking/working surface and its highest point is not more than 45 inches (1.3m)[50 inches (1.3m) when overhand bricklaying operations are being performed] from the walking/working surface.
  - Each line will have a minimum breaking strength of 200 pounds (.88kN).
- 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 will be removed.

### Safety Monitoring Systems

Safety monitoring systems and their use will comply with the following provisions:

- SBE BUILDERS will designate a competent person to monitor the safety of other employees and SBE BUILDERS will ensure that the safety monitor complies with the following:
  - The safety monitor will be competent to recognize fall hazards
  - The safety monitor will 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 will be on the same walking/working surface and within visual

sighting distance of the employee being monitored

- The safety monitor will be close enough to communicate orally with the employee
- The safety monitor will not have other responsibilities which could take the monitor's attention from the monitoring function
- Mechanical equipment will not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operation on low-slope roofs.
- No employee, other than an employee engaged in roofing work (on low-sloped roofs) or an employee covered by a fall protection plan, will be allowed in an area where an employee is being protected by a safety monitoring system.
- Each employee working in a controlled access zone will be directed to comply promptly with fall hazard warnings from safety monitors.

### Covers

Covers for holes in floors, roofs, and other walking/working surfaces will meet the following requirements:

- Covers located in roadways and vehicular aisles will be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.
- All other covers will be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.
- All covers will be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
- All covers will be color coded or they will be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

### Protection From Falling Objects

Falling object protection will comply with the following provisions:

Toeboards, when used as falling object protection, will be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

Toeboards will be capable of withstanding, without failure, a force of at least 50 pounds (222N) applied in any downward or outward direction at any point along the toeboard.

Toeboards will be a minimum of 3 1/2 inches (9cm) in vertical height from their top edge to the level of the walking/working surface. They will have not more than 1/4 inch (0,6cm)

clearance above the walking/working surface. They will be solid or have openings not over 1 inch (2.5cm) in greatest dimension.

Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening will be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.

Guardrail systems, when used as falling object protection, will have all openings small enough to prevent passage of potential falling objects.

During the performance of overhand bricklaying and related work:

- No materials or equipment except masonry and mortar will be stored within 4 feet (1.2m) of the working edge.
- Excess mortar, broken or scattered masonry units, and all other materials and debris will be kept clear from the work area by removal at regular intervals.

During the performance of roofing work:

- Materials and equipment will not be stored within 6 feet (1.8m) of roof edge unless guardrails are erected at the edge.
- Materials which are piled, grouped, or stacked near a roof edge will be stable and self-supporting.

Canopies, when used as falling object protection, will be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

### Fall Protection Plan

This option is available only to employees engaged in leading edge work, precast concrete erection work, or residential construction work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan must conform to the following provisions.

- The fall protection plan will be prepared by a qualified person and developed specifically for the site where the leading edge work, precast concrete work, or residential construction work is being performed and the plan must be maintained up to date.
- Any changes to the fall protection plan will be approved by a qualified person.
- A copy of the fall protection plan with all approved changes will be maintained at the job site.
- The implementation of the fall protection plan will be under the supervision of a competent person.

- The fall protection plan will document the reasons why the use of conventional fall protection systems (guardrails systems, personal fall arrest systems, or safety nets systems) are infeasible or why their use would create a greater hazard.
- The fall protection plan will 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 from the conventional fall protection systems. For example, SBE BUILDERS will 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 will identify each location where conventional fall protection methods cannot be used. These locations will then be classified as controlled access zones.

Where no other alternative measure has been implemented, SBE BUILDERS will implement a safety monitoring system.

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

In the event an employee falls, or some other related, serious incident occurs (e.g., a near miss) the employer will 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 will implement those changes to prevent similar types of falls or incidents.

### **1.3 TRAINING REQUIREMENTS**

#### Training Program

SBE BUILDERS will provide a training program for each employee who might be exposed to fall hazards. The program will enable each employee to recognize the hazards of falling and will train each employee in the procedures to be followed in order to minimize these hazards.

SBE BUILDERS will assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:

- The nature of fall hazards in the work area
- The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used
- The use and operation of guardrail system, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used
- The role of each employee in the safety monitoring system when this system is used

- The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs
- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
- The role of employees in fall protection plans
- The standards contained in this subpart

### Certification of Training

SBE BUILDERS will verify compliance with the above paragraph by preparing a written certification record. The written certification record will contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the supervisor. If SBE BUILDERS relies on training conducted by another employer or completed prior to the effective date of this section, the certification record will indicate the date the employer determined the prior training was adequate rather than the date of actual training.

The latest training certification will be maintained.

### Retraining

When the supervisor has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by the above paragraph, SBE BUILDERS will retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes in the workplace render previous training obsolete
- Changes in the types of fall protection equipment to be used render previous training obsolete
- Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill

## **1.4 STATEMENT OF COMPANY POLICY**

SBE BUILDERS is dedicated to the protection of its employees from on-the-job injuries. All employees of SBE BUILDERS have the responsibility to work safely on the job. The purpose of this plan is to supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on this job and to ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start of erection.

This fall protection plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as identifying specific activities that require nonconventional means of fall protection. These areas include:

- Connecting activity (point of erection).
- Unprotected sides or edge.
- Installation of floor sheathing and joists.
- Erecting exterior walls
- Leading edge work.
- Grouting.
- Roof sheathing operations.
- Setting and bracing of roof trusses and rafters

In these cases, conventional fall protection systems may not be the safest choice. This plan is designed to enable employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces.

Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employees opinion, this is the case, the employee is to notify the foreman of the concern and the concern addressed before proceeding.

Safety policy and procedure on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to SBE BUILDERS; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding and cooperative effort, rather than by strict enforcement, If for any reason an unsafe act persists, strict enforcement will be implemented.

It is the responsibility of \_\_\_to implement this Fall Protection Plan.\_\_\_is responsible for continual observational safety checks of their work operations and to enforce the safety policy and procedures. The crew supervisor or foreman\_\_\_is responsible for correcting any unsafe acts or conditions immediately.

It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instruction of the crew supervisor or foreman. It is also the responsibility of the employee to bring to management’s attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees. Any changes to this Fall Protection Plan must be approved by \_\_\_\_\_.

### **1.5 FALL PROTECTION SYSTEMS FOR PRECAST/PRESTRESS STRUCTURES**

Where conventional fall protection is infeasible or creates a greater hazard at the leading edge and during initial connecting activity, we plan to do this work using a safety monitoring system and expose only a minimum number of employees for the time necessary to actually accomplish the job. The maximum number of workers to be monitored by one safety monitor is six (6). We are designating the following trained employees as designated erectors and they are permitted to enter the controlled access zones and work without the use of conventional fall protection.

**Safety Monitor:** \_\_\_\_\_

**Designated Erector:** \_\_\_\_\_

The safety monitor will be identified by wearing a \_\_\_\_\_ hard hat. The designated erectors will be identified by one of the following methods:

- They will wear a \_\_\_\_\_ colored arm band
- They will wear a \_\_\_\_\_ colored hard hat
- They will wear a \_\_\_\_\_ colored vest

Only individuals with the appropriate experience, skills, and training will be authorized as designated erectors. All employees that will be working as designated erectors under the safety monitoring system will have been trained and instructed in the following areas:

- Recognition of the fall hazards in the work area (at the leading edge and when making initial connection s--point of erection).
- Avoidance of fall hazards using established work practices which have been made known to the employees.
- Recognition of unsafe- practices or working conditions that could lead to a fall, such as windy conditions.
- The function, use, and operation of safety monitoring systems, guardrail systems, body belt/harness systems, control zones and other protection to be used.
- The correct procedure for erecting, maintaining, disassembling and inspecting the system(s) to be used.
- Knowledge of construction sequence or the erection plan.

A conference will take place prior to starting work involving all members of the erection, crew, crane crew and supervisors of any other concerned contractors. This conference will be conducted by the precast concrete erection supervisor in charge of the project. During the pre-work conference, erection procedures and sequences pertinent to this job will be thoroughly discussed and safety practices to be used throughout the project will be specified. Further, all personnel will be informed that the controlled access zones are off limits to all personnel other than those designated erectors specifically trained to work in that area.

#### Safety Monitoring System:

A safety monitoring system is a fall protection system in which a competent person is responsible for recognizing and warning employees of fall hazards. The duties of the safety monitor are to:

- Warn by voice when approaching the open edge in an unsafe manner.
- Warn by voice if there is a dangerous situation developing which cannot be seen by another person involved with product placement, such as a member getting out of control.
- Make the designated erectors aware they are in a dangerous area.
- Be competent in recognizing fall hazards.
- Warn employees when they appear to be unaware of a fall hazard or are acting in an unsafe manner.
- Be on the same walking/working surface as the monitored employees and within visual sighting distance of the monitored employees.
- Be close enough to communicate orally with the employees.
- Not allow other responsibilities to encumber monitoring. If the safety monitor becomes too encumbered with other responsibilities, the monitor will:
  - Stop the erection process
  - Turn over other responsibilities to a designated erector
  - Turn over the safety monitoring function to another designated, competent person.

The safety monitoring system will not be used when the wind is strong enough to cause loads with large surface areas to swing out of radius, or result in loss of control of the load, or when weather conditions cause the walking/working surfaces to become icy or slippery.

#### Control Zone System:

A controlled access zone is an area designated and clearly marked, in which leading edge work may take place without the use of guardrail, safety net or personal fall arrest systems to protect the employees in the area. Control zone systems will comply with the following provisions:

- When used to control access to areas where leading edge and other operations are taking place the controlled access zone will be defined by a control line or by any other means that restricts access.

When control lines are used, they will be erected not less than 6 feet (1.8m) nor more than 60 feet (18m) or half the length of the member being erected, whichever is less, from the leading edge.

- The control line will extend along the entire length of the unprotected or leading edge and will be approximately parallel to the unprotected or leading edge.
- The control line will be connected on each side to a guardrail system or wall.
- Control lines will consist of ropes, wires, tapes, or equivalent materials, and supporting

stanchions as follows:

- Each line will be flagged or otherwise clearly marked at not more than 6 foot (1.8m) intervals with high-visibility material.
- Each line will be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3m) from the walking/working surface.
- Each line will have a minimum breaking strength of 200 pounds (.88kN).

#### Holes:

All openings greater than 12 in. x 12 in. will have perimeter guarding or covering. All predetermined holes will have the plywood covers made in the precasters' yard and shipped with the member to the jobsite. Prior to cutting holes on the job, proper protection for the hole must be provided to protect the workers. Perimeter guarding or covers will not be removed without the approval of the erection foreman.

Precast concrete column erection through the existing deck required that many holes be provided through this deck. These are to be covered and protected. Except for the opening being currently used to erect a column, all opening protection is to left undisturbed. The opening being uncovered to erect a column will become part of the point of erection and will be addressed as part of this fall protection plan. This uncovering is to be done at the erection foreman's direction and will only occur immediately prior to "feeding" the columns through the opening. Once the end of the column is through the slab opening, there will no longer exist a fall hazard at this location.

#### Implementation of Fall Protection Plan:

EXAMPLE: The structure being erected is a multistory total precast concrete building consisting of columns, beams, wall panels and hollow core slabs and double tee floor and roof members.

The following is a list of the products and erection situations for this job:

#### Columns:

For columns 10 ft to 36 ft long, employees disconnecting crane hooks from columns will work from a ladder and wear a body belt/harness with lanyard and be tied off when both hands are needed to disconnect. For tying off, a vertical lifeline will be connected to the lifting eye at the top of the column, prior to lifting, to be used with a manually operated or mobile rope grab. For columns too high for the use of a ladder, 36 ft and higher, an added cable will be used to reduce the height of the disconnecting point so that a ladder can be used. This cable will be left in place until a point in erection that it can be removed safely. In some cases, columns will be unhooked from the crane by using an erection tube or shackle with a pull pin which is released from the ground after the column is stabilized.

The column will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

### Inverted Tee Beams:

Employees erecting inverted tee beams, at a height of 6 to 40 ft, will erect the beam, make initial connections, and in alignment from a ladder. If the employee needs to reach over the side of the beam to bar or make an adjustment to the alignment of the beam, they will mount the beam and be tied off to the lifting device in the beam after ensuring the load has been stabilized on its bearing. To disconnect the crane from the beam an employee will stand a ladder against the beam. Because the use of ladders is not practical at heights above 40 ft, beams will be initially placed with the use of tag lines and their final alignment made by a person on a manlift or similar employee positioning systems.

### Spandrel Beams:

Spandrel beams at the exterior of the building will be aligned as closely as possible with the use of tag lines with the final placement of the spandrel beam made from a ladder at the open end of the structure. A ladder will be used to make the initial connections and a ladder will be used to disconnect the crane. The other end of the beam will be placed by the designated erector from the double tee deck under the observation of the safety monitor.

The beams will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

### Floor and Roof Members:

During installation of the precast concrete floor and/or roof members, the work deck continuously increases in area as more and more units are being erected and positioned. Thus, the unprotected floor/roof perimeter is constantly modified with the leading edge changing location as each member is installed. The fall protection for workers at the leading edge will be assured by properly constructed and maintained control zone lines not more than 60 ft away from the leading edge supplemented by a safety monitoring system to ensure the safety of all designated erectors working within the area defined by the control zone lines.

The hollow core slabs erected on the masonry portion of the building will be erected and grouted using the safety monitoring system. Grout will be placed in the space between the end of the slab and face shell of the concrete masonry by dumping from a wheelbarrow. The grout in the keyways between the slabs will be dumped from a wheelbarrow and then spread with long handled tools, allowing the worker to stand erect facing toward the unprotected edge and back from any work deck edge.

Whenever possible, the designated erectors will approach the incoming member at the leading edge only after it is below waist height so that the member itself provides protection against falls.

Except for the situations described below, when the arriving floor or roof member is within 2 to 3 inches of its final position, the designated erectors can then proceed to their position of erection at each end of the member under the control of the safety monitor. Crane hooks will be unhooked from double tee members by designated erectors under the direction and supervision of the safety monitor.

Designated erectors, while waiting for the next floor or roof member, will be constantly under the control of the safety monitor for fall protection and are directed to stay a minimum of six (6) feet from the edge. In the event a designated erector must move from one end of a member, which has just been placed at the leading edge, they must first move away from the leading edge a

minimum of six (6) ft and then progress to the other and while maintaining the minimum distance of six (6) ft at all times.

Erection of double tees, where conditions require bearing of one end into a closed pocket and the other end on a beam ledge, restricting the tee legs from going directly into the pockets, require special considerations. The tee legs that are to bear in the closed pocket must hang lower than those at the beam bearing. The double tee will be "two-lined" in order to elevate one end higher than the other to allow for the low end to be ducked into the closed pocket using the following procedure.

The double tee will be rigged with a standard four-way spreader off of the main load line, an additional choker will be attached to the married point of the two-legged spreader at the end of the tee that is to be elevated. The double tee will be hoisted with the main load line and swung into a position as close as possible to the tee's final bearing elevation. When the tee is in this position and stabilized, the whip line load block will be lowered to just above the tee deck. At this time, two erectors will walk out on the suspended tee deck at midspan of the tee member and pull the load block to the end of the tee to be elevated and attach the additional choker to the load block. The possibility of entanglement with the crane lines and other obstacles during this two lining process while raising and lowering the crane block on that second line could be hazardous to an encumbered employee. Therefore, the designated erectors will not tie off during any part of this process. While the designated erectors are on the double tee, the safety monitoring system will be used. After attaching the choker, the two erectors then step back on the previously erected tee deck and signal the crane operator to hoist the load with the whip line to the elevation that will allow for enough clearance to let the low end tee legs slide into the pockets when the main load line is lowered.

The erector, who is handling the lowered end of the tee at the closed pocket bearing, will step out on the suspended tee. An erection bar will then be placed between the end of the tee leg and the inside face of the pocketed spandrel member. The tee is barred away from the pocketed member to reduce the friction and lateral force against the pocketed member. As the tee is being lowered, the other erector remains on the tee which was previously erected to handle the other end. At this point the tee is slowly lowered by the crane to a point where the tee legs can freely slide into the pockets. The erector working the lowered end of the tee must keep pressure on the bar between the tee and the face of the pocketed spandrel member to very gradually let the tee legs slide into the pocket to its proper bearing dimension. The tee is then slowly lowered into its final erected position.

The designated erector should be allowed onto the suspended double tee, otherwise there is no control over the horizontal movement of the double tee and this movement could knock the spandrel off of its bearing or the column out of plumb. The control necessary to prevent hitting the spandrel can only be done safely from the top of the double tee being erected.

**Loadbearing Wall Panels:** The erection of the loadbearing wall panels on the elevated decks requires the use of a safety monitor and a controlled access zone that is a minimum of 25 ft and a maximum of 1/2 the length of the wall panels away from the unprotected edge, so that designated erectors can move freely and unencumbered when receiving the panels. Bracing, if required for stability, will be installed by ladder. After the braces are secured, the crane will be disconnected from the wall by using a ladder. The

wall to wall connections will also be performed from a ladder.

**Non-Loadbearing Panels (Cladding):** The location of survey lines, panel layout and other installation prerequisites (prewelding, etc.) for non-loadbearing panels (cladding) will not commence until floor perimeter and floor openings have been protected. In some areas, it is necessary because of panel configuration to remove the perimeter protection as the cladding is being installed. Removal of perimeter protection will be performed on a bay to bay basis, just ahead of cladding erection to minimize temporarily unprotected floor edges. Those workers within 6 ft of the edge, receiving and positioning the cladding when the perimeter protection is removed will be tied off.

#### Detailing:

Employees exposed to falls of six (6) feet or more to lower levels, who are not actively engaged in leading edge work or connecting activity, such as welding, bolting, cutting, bracing, guying, patching, painting, or other operations, and who are working less than six(6) ft from an unprotected edge will be tied off at all times or guardrails will be installed. Employees engaged in these activities but who are more than six (6) ft from an unprotected edge as defined by the control zone lines, do not require fall protection but a warning line or control lines must be erected to remind employees they are approaching an area where fall protection is required.

## **1.6 FALL PROTECTION SYSTEMS TO BE USED FOR RESIDENTIAL CONSTRUCTION**

Installation of roof trusses/rafters, exterior wall erection, roof sheathing, floor sheathing and joist/truss activities will be conducted by employees who are specifically trained to do this type of work and are trained to recognize the fall hazards. The nature of such work normally exposes the employee to the fall hazard for a short period of time. This Plan details how SBE BUILDERS minimizes these hazards.

### Controlled Access Zones

When using the Plan to implement the fall protection options available, workers must be protected through limited access to high hazard locations. Before any non-conventional fall protection systems are used as part of the work plan, a Controlled Access Zone (CAZ) will be clearly defined by the competent person as an area where a recognized hazard exists. The demarcation of CAZ will be communicated by the competent person in a recognized manner, either through signs, wires, tapes, ropes or chains.

SBE BUILDERS will take the following steps to ensure that the CAZ is clearly marked or controlled by the competent person:

1. All access to the CAZ must be restricted to authorized entrants.
2. All workers who are permitted in the CAZ will be listed in the appropriate sections of the Plan (or be visibly identifiable by the competent person) prior to implementation.
3. The competent person will ensure that all protective elements of the CAZ be implemented prior to the beginning of work.

## Installation Procedures for Roof Truss and Rafter Erection

During the erection and bracing of roof trusses/rafters, conventional fall protection may present a greater hazard to workers. Safety nets, guardrails and personal fall arrest systems will not provide adequate fall protection because the nets will cause the walls to collapse, while there are no suitable attachment or anchorage points for guardrails or personal fall arrest systems.

Jobs requiring workers to use a ladder for the entire installation process will cause a greater hazard because the worker must stand on the ladder with his back or side to the front of the ladder. While erecting the truss or rafter the worker will need both hands to maneuver the truss and therefore cannot hold onto the ladder. In addition, ladders cannot be adequately protected from movement while trusses are being maneuvered into place. Many workers may experience additional fatigue because of the increase in overhead work with heavy materials, which can also lead to a greater hazard.

Exterior scaffolds cannot be utilized on this job because the ground, after recent backfilling, cannot support the scaffolding. In most cases, the erection and dismantling of the scaffold would expose workers to a greater fall hazard than erection of the trusses/rafters.

On all walls eight feet or less, workers will install interior scaffolds along the interior wall below the location where the trusses/rafters will be erected. "Sawhorse" scaffolds constructed of 46 inch sawhorses; and 2 x 10 planks will often allow workers to be elevated high enough to allow for the erection of trusses and rafters without working on the top plate of the wall.

In structures that have walls higher than eight feet and where the use of scaffolds and ladders would create a greater hazard, safe working procedures will be utilized when working on the top plate and will be monitored by the crew supervisor. During all stages of truss/rafter erection the stability of the trusses/rafters will be ensured at all times.

SBE BUILDERS will take the following steps to protect workers who are exposed to fall hazards while working from the top plate installing trusses/rafters:

- Only the following trained workers will be allowed to work on the top plate during roof truss or rafter installation:

\_\_\_\_\_

\_\_\_\_\_

- Workers will have no other duties to perform during truss/rafter erection procedures.
- All trusses/rafters will be adequately braced before any worker can use the truss/rafter as a support.
- Workers will remain on the top plate using the previously stabilized truss/rafter as a support while other trusses/rafters are being erected.
- Workers will leave the area of the secured trusses only when it is necessary to secure another truss/rafter.

- The first two trusses/rafters will be set from ladders leaning on side walls at points where the walls can support the weight of the ladder.
- A worker will climb onto the interior top plate via a ladder to secure the peaks of the first two trusses/rafters being set.

The workers responsible for detaching trusses from cranes and/or securing trusses at the peaks traditionally are positioned at the peak of the trusses/rafters. There are also situations where workers securing rafters to ridge beams will be positioned on top of the ridge beam.

SBE BUILDERS will take the following steps to protect workers who are exposed to fall hazards while securing trusses/rafters at the peak of the trusses/ridge beam:

- Only the following trained workers will be allowed to work at the peak during roof truss or rafter installation:

_____	_____
_____	_____

- Once truss or rafter installation begins, workers not involved in that activity will not stand or walk below or adjacent to the roof opening or exterior walls in any area where they could be struck by falling objects.
- Workers will have no other duties than securing/bracing the trusses/ridge beam.
- Workers positioned at the peaks or in the webs of trusses or on top of the ridge beam will work from a stable position, either by sitting on a "ridge seat" or other equivalent surface that provides additional stability or by positioning themselves in previously stabilized trusses/rafters and leaning into and reaching through the trusses/rafters.
- Workers will not remain on or in the peak/ridge any longer than necessary to safely complete the task.

### Roof Sheathing Operations

Workers typically install roof sheathing after all trusses/rafters and any permanent truss bracing is in place. Roof structures are unstable until some sheathing is installed, so workers installing roof sheathing cannot be protected from fall hazards by conventional fall protection systems until it is determined that the roofing system can be used as an anchorage point. At that point, employees will be protected by a personal fall arrest system.

Trusses/rafters are subject to collapse if a worker falls while attached to a single truss with a belt/harness. Nets could also cause collapse, and there is no place to attach guardrails.

All workers will ensure that they have secure footing before they attempt to walk on the sheathing, including cleaning shoes/boots of mud or other slip hazards.

To minimize the time workers must be exposed to a fall hazard, materials will be staged to allow for the quickest installation of sheathing.

SBE BUILDERS will take the following steps to protect workers who are exposed to fall hazards while installing roof sheathing:

Once roof sheathing installation begins, workers not involved in that activity will not stand or walk below or adjacent to the roof opening or exterior walls in any area where they could be struck by falling objects.

The competent person will determine the limits of this area, which will be clearly communicated to workers prior to placement of the first piece of roof sheathing.

The competent person may order work on the roof to be suspended for brief periods as necessary to allow other workers to pass through such area when this would not create a greater hazard.

Only qualified workers will install roof sheathing.

The bottom row of roof sheathing may be installed by workers standing in truss webs.

After the bottom row of roof sheathing is installed, a slide guard extending the width of the roof will be securely attached to the roof. Slide guards are to be constructed of no less than nominal 4" height capable of limiting the uncontrolled slide of workers. Workers should install the slide guard while standing in truss webs and leaning over the sheathing.

Additional rows of roof sheathing may be installed by workers positioned on previously installed rows of sheathing. A slide guard can be used to assist workers in retaining their footing during successive sheathing operations.

Additional slide guards will be securely attached to the roof at intervals not to exceed 13 feet as successive rows of sheathing are installed. For roofs with pitches in excess of 9-in-12, slide guards will be installed at four-foot intervals.

When wet weather (rain, snow, or sleet) are present, roof sheathing operations will be suspended unless safe footing can be assured for those workers installing sheathing.

When strong winds (above 40 miles per hour) are present, roof sheathing operations are to be suspended unless wind breakers are erected.

### Installation of Floor Joists and Sheathing

During installation of floor sheath in g/joists (leading edge construction), the following steps will be taken to protect workers:

- Only the following trained workers will be allowed to install floor joists or sheathing:

- 
- Materials for the operations will be conveniently staged to allow for easy access to workers.
  - The first floor joists or trusses will be rolled into position and secured either from the ground, ladders or sawhorse scaffolds.
  - Each successive floor joist or truss will be rolled into place and secured from a platform created from a sheet of plywood laid over the previously secured floor joists or trusses.
  - Except for the first row of sheathing which will be installed from ladders or the ground, workers will work from the established deck.
  - Any workers not assisting in the leading edge construction while leading edges still exist (e.g., cutting the decking for the installers) will not be permitted within six feet of the leading edge under construction.

### Erection of Exterior Walls

During the construction and erection of exterior walls, SBE BUILDERS will take the following steps to protect workers:

- Only the following trained workers will be allowed to erect exterior walls:

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- A painted line six feet from the perimeter will be clearly marked prior to any wall erection activities to warn of the approaching unprotected edge.
- Materials for operations will be conveniently staged to minimize fall hazards.
- Workers constructing exterior walls will complete as much cutting of materials and other preparation as possible away from the edge of the deck.

## **1.7 ENFORCEMENT**

Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The crew supervisor or foreman, as well as individuals in the Safety and Personnel Department, reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

## **1.8 ACCIDENT INVESTIGATIONS**

All accidents that result in injury to workers, regardless of their nature, will be investigated and reported. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a reoccurrence.

In the event that an employee falls or there is some other related, serious incident occurring, this

plan will be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.

## 1.9 CHANGES TO PLAN

Any changes to the plan will be approved by \_\_\_\_ This plan will be reviewed by a qualified person as the job progresses to determine if additional practices, procedures or training needs to be implemented by the competent person to improve or provide additional fall protection. Workers will be notified and trained, if necessary, in the new procedures. A copy of this plan and all approved changes will be maintained at the jobsite.

## 1.10 GLOSSARY OF TERMS

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

Body Belt (safety belt) - a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device. (No longer acceptable for fall protection after 1-1-98)

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.

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 dee-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

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

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

Deceleration Device - any mechanism, such as a rope grab, rip-stitch lanyard, speciallywoven 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.

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

Failure - 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 System - a barrier erected to prevent employees from falling to lower levels.

Hole - a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.

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

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

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

Lifeline - a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

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

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

Mechanical Equipment - all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars.

Opening - a gap or void 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a

wall or partition, through which employees can fall to a lower level.

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

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

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

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

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

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

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

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. Snaphooks are generally one of two types.

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

Steep Roof - a roof having a slope greater than 4 to 12 inches (vertical to horizontal).

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

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

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

Warning Line System - means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

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

# CERTIFICATION OF TRAINING FOR FALL PROTECTION

Employee Name: \_ID# \_\_\_\_\_

Training Program included:

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Date Training Completed: \_\_\_\_\_

Training Conducted By: \_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

# **SBE BUILDERS**