

<p>Safety Manual</p> <p>Therma Fall Protection Program</p>
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Policy Section No.:35
Revision No.: 3

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Fall Protection Program

1. OBJECTIVE:

- 1.2 The objective of the **Therma's** Fall Protection Program is to identify and evaluate fall hazards to which employees will be exposed, and to provide specific training as required by the Occupational Safety and Health Administration (OSHA) Fall Protection Standard, 29 CFR 1926, Subpart M.

2. POLICY:

- 2.1 It is the policy of **Therma's** to protect its employees from occupational injuries by implementing and enforcing safe work practices and appointing a competent person(s) to manage the Fall Protection Program. The **Therma** Fall Protection Program shall comply with the OSHA requirements. A copy of the OSHA Fall Protection Standard shall be made available to all employees, and may be obtained from the **Safety Department.**
- 2.2 Fall Protection is required when ever employees are exposed to any fall from heights of (6) six feet or greater to lower levels. This includes work near and around excavations.

3. ASSIGNMENT OF RESPONSIBILITY:

3.1 **Employer:**

- 3.1.1 It is the responsibility of **Therma** to provide fall protection to affected employees, and to ensure that all employees understand and adhere to the procedures of this plan.

3.2 **Program Manager:**

- 3.2.1 The Safety Department Manager is responsible for implementation of the Fall Protection Program.

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3.2.2 The Safety Department Manager or his/her designated representative is responsible for the following:

- a. Performing routine safety checks of work operations.
- b. Enforcing **Therma** safety policy and procedures.
- c. Correcting any unsafe practices or conditions immediately.
- d. Training employees and supervisors in recognizing fall hazards and the use of fall protection systems.
- e. Maintaining records of employee training, equipment issue, and fall protection systems used at **Therma** jobsites.
- f. Investigating and documenting all incidents that result in employee injury.

3.2.3 The **EH & S Manager** and/or his/her representative shall be adequately trained in Fall Protection Systems use, care and inspection.

3.3 Supervisors:

3.3.1 It is the responsibility of all supervisors to:

- a. Inspect jobsites daily for fall hazards.
- b. Ensure field compliance with the written program.
- c. Enforcement of program requirements.
- d. Ensuring employees are working in a safe manner when exposed to any and all fall hazards.

3.4 **Employees:**

3.4.1 It is the responsibility of all employees to:

- a. Understand and adhere to the procedures outlined in this Fall Protection Program.
- b. Bring to management's attention any unsafe or hazardous conditions or practices that may cause injury to either themselves or any other employees.
- c. Report any incident that causes injury to an employee, regardless of the nature of the injury.

4. TRAINING:

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- 4.1 All employees who may be exposed to fall hazards are required to receive training on how to recognize such hazards, and how to minimize their exposure to them. Employees shall receive training as soon after employment as possible, and before they are required to work in areas where fall hazards exist.
- 4.2 A record of employees who have received training and training dates shall be maintained by the **Safety Department**. Training of employees by the **Safety Department** shall include:
 - 4.2.1 Nature of the fall hazards employees may be exposed to.
 - 4.2.2 Correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems.
 - 4.2.3 Use and operation of controlled access zones, guardrails, personal fall arrest systems, safety nets, warning lines, and safety monitoring systems.
 - 4.2.4 Role of each employee in the Safety Monitoring System (if one is used).
 - 4.2.5 Correct procedures for equipment, materials handling, storage, and erection of overhead protection.
 - 4.2.6 Role of each employee in alternative Fall Protection Plans (if used).
 - 4.2.7 Requirements of the OSHA Fall Protection Standard, 29 CFR 1926, Subpart M.
 - 4.2.8 **Therma's** requirements for reporting incidents that cause injury to an employee.
- 4.3 Additional training shall be provided on an annual basis, or as needed when changes are made to this Fall Protection Program, an alternative Fall Protection Plan, or the OSHA Fall Protection Standard.
- 4.4 Retraining of the employee shall be conducted when:
 - 4.4.1 Deficiencies in the original training has been noted, changes in the work places occur, and/or, fall protection systems or equipment change that render previous training obsolete.
- 4.5 Fall protection training documentation shall include:
 - 4.5.1 Who was trained, training dates and instructor signature.

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- 4.6 Training certification(s) expire after (3) years from the original training date.

5 CONTROLLED ACCESS ZONES:

- 5.1 **Therma employees** are prohibited from entering controlled access zones.
- 5.2 Controlled access zones shall be defined by control lines consisting of ropes, wires, tapes, or equivalent material with supporting stanchions, and shall be:
- 5.3.1 Flagged with a high-visibility material at six (6) foot intervals.
 - 5.3.2 Rigged and supported so that the line is between 30 and 50 inches (including sag) from the walking / working surface.
 - 5.3.3 Strong enough to sustain stress of at least 200 pounds.
 - 5.3.4 Extended along the entire length of an unprotected or leading edge.
 - 5.3.5 Parallel to the unprotected or leading edge.
 - 5.3.6 Connected on each side to a guardrail system or wall.
 - 5.3.7 Erected between six (6) feet and 25 feet from an unprotected edge, except in the following cases:
 - a. When working with precast concrete members, between six (6) feet and 60 feet from the leading edge, or half the length of the member being erected, whichever is less.
 - b. When performing overhand bricking or related work, between ten (10) feet and 15 feet from the working edge.

6. EXCAVATIONS:

- 6.1 Fall protection will be provided to employees working at the edge of an excavation that is six (6) feet or deeper. Employees in these areas are required to use the fall protection systems as designated in this program.
- 6.1.1 Excavations that are six (6) feet or deeper shall be protected by guardrail systems, fences, barricades, or covers.
 - 6.1.2 Walkways that allow employees to cross over an excavation that is six (6) feet or deeper shall be equipped with guardrails.

7. FALL PROTECTION SYSTEMS:

7.1 Covers:

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- 7.1.1 All covers shall be secured to prevent accidental displacement.
- 7.1.2 Covers shall be color-coded or bear the markings “HOLE” or “COVER”.
- 7.1.3 Covers located in roadways shall be able to support twice the axle load of the largest vehicle that might cross them.
- 7.1.4 Covers shall be able to support twice the weight of employees, equipment, and materials that might cross them.

7.2 Guardrail Systems:

- 7.2.1 Guardrail systems shall be erected at unprotected edges, ramps, runways, or holes where it is determined that erecting such systems will not cause an increased hazard to employees. The following specifications will be followed in the erection of guardrail systems. Toprails shall be:
 - a. At least ¼ inch in diameter (steel or plastic banding is unacceptable).
 - b. Flagged every six (6) feet or less with a high visibility material if wire rope is used.
 - c. Forty-two (42) inches (plus or minus three (3) inches) above the walking/working level.
 - d. Adjusted to accommodate the height of stilts, if they are in use.
- 7.2.2 Midrails, screens, mesh, intermediate vertical members, and solid panels shall be erected in accordance with the OSHA Fall Protection Standard.
- 7.2.3 Gates or removable guardrail sections shall be placed across openings of hoisting areas or holes when they are not in use to prevent access.

7.3 Personal Fall Arrest Systems:

- 7.3.1 Personal fall arrest systems shall be issued to and used by employees and may consist of an ANSI certified full-body

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harness, anchorage, connectors, deceleration device, lifeline, or suitable combinations. Personal fall arrest systems shall:

- a. Limit the maximum arresting force to 1800 pounds.
- b. Be rigged so an employee cannot free fall more than six (6) feet or contact any lower level and, where practicable, the anchor end of the lanyard shall be secured at a level not lower than the employee's waist.
- c. Bring an employee to a complete stop and limit the maximum deceleration distance traveled to three and a half (3 ½) feet.
- d. Be strong enough to withstand twice the potential impact energy of an employee free falling six (6) feet (or the free fall distance permitted by the system, whichever is less).
- e. Be inspected prior to each use for damage and deterioration.
- f. Be removed from service if any damaged components are detected.

7.3.2 All components of a fall arrest system including descent control, and rescue equipment shall meet the specifications of the OSHA Fall Protection Standard, and shall be used in accordance with the manufacturer's recommendations.

- a. The use of non-locking snaphooks is prohibited.
- b. Dee-rings and locking snaphooks shall:
 1. Have a minimum tensile strength of 5000 pounds.
 2. Be proof-tested to a minimum tensile load of 3600 pounds without cracking, breaking, or suffering permanent deformation.
- c. Lifelines shall be:
 1. Designed, installed, and used under the supervision of the **Safety Department**:
 2. Protected against cuts and abrasions.
 3. Equipped with horizontal lifeline connection devices capable of locking in both directions on the lifeline when used on suspended scaffolds or similar

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work platforms that have horizontal lifelines that may become vertical lifelines.

- d. Self-retracting lifelines and lanyards must have ropes and straps (webbing) made of synthetic fibers, and shall:
 - 1. Sustain a minimum tensile load of 3600 pounds if they automatically limit free fall distance to two (2) feet.
 - 2. Sustain a minimum tensile load of 5000 pounds (includes ripstitch, tearing, and deforming lanyards).
- e. Anchorages must support at least 5000 pounds per person attached and shall be:
 - 1. Capable of supporting twice the weight expected to be imposed on it.
 - 2. Independent of any anchorage used to support or suspend platforms.

7.4 Positioning Device Systems:

- 7.4.1 Body belt or body harness systems shall be set up so that an employee can free fall no farther than two (2) feet, and shall be secured to an anchorage capable of supporting twice the potential impact load or 3000 pounds, whichever is greater. Requirements for snaphooks, dee-rings, and other connectors are the same as detailed in this Program under ***Personal Fall Arrest Systems***.

7.5 Safety Monitoring Systems:

- 7.5.1 In situations when no other fall protection can be implemented, the safety monitor shall be appointed to monitor the activities of employees in the hazard area. The safety monitor shall be:
 - a. Competent in the recognition of fall hazards.
 - b. Capable of warning workers of fall hazard dangers.
 - c. Operating on the same walking / working surfaces as the employees and able to see them.
 - d. Close enough to work operations to communicate orally with employees.

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- e. Free of other job duties that might distract them from the monitoring function.

7.5.2 No employees other than those engaged in the work being performed under the Safety Monitoring System shall be allowed in the area. All employees under a Safety Monitoring System are required to promptly comply with the fall hazard warnings of the **EH & S Manager**.

7.6 Safety Net Systems:

- 7.6.1 Safety net systems must be installed no more than 30 feet below the walking / working surface with sufficient clearance to prevent contact with the surface below, and shall be installed with sufficient vertical and horizontal distances as described in the OSHA Fall Protection Standard.
- 7.6.2 All nets shall be inspected at least once a week for wear, damage, or deterioration by a competent person. Defective nets shall be removed from use and replaced with acceptable nets.
- 7.6.3 All nets shall be in compliance with mesh, mesh crossing, border rope, and connection specifications as described in the OSHA Fall Protection Standard.
- 7.6.4 When nets are used on bridges, the potential fall area from the walking / working surface shall remain unobstructed.
- 7.6.5 Objects that have fallen into safety nets shall be removed as soon as possible and at least before the next working shift.

7.7 Warning Line Systems:

- 7.7.1 Warning line systems consisting of supporting stanchions and ropes, wires, or chains shall be erected around all sides of roof work areas.
- 7.7.2 Lines shall be flagged at no more than six (6) foot intervals with high-visibility materials.
- 7.7.3 The lowest point of the line (including sag) shall be between 34 and 39 inches from the walking / working surface.
- 7.7.4 Stanchions of warning line systems shall be capable of resisting at least 16 pounds of force.
- 7.7.5 Ropes, wires, or chains must have a minimum tensile strength of 500 pounds.

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- 7.7.6 Warning line systems shall be erected at least six (6) feet from the edge, except in areas where mechanical equipment is in use. When mechanical equipment is in use, warning line systems shall be erected at least six (6) feet from the parallel edge, and at least ten (10) feet from the perpendicular edge.

8 TASKS AND WORK AREAS REQUIRING FALL PROTECTION:

- 8.1 Unless otherwise specified, **Safety Department** shall evaluate the worksite(s) and determine the specific type(s) of fall protection to be used in the following situations.

8.1.1 Framework and Reinforcing Steel:

- a. Fall protection will be provided when an employee is climbing or moving at a height of over 24 feet when working with rebar assemblies.

8.1.2 Hoist Areas:

- a. Guardrail systems or personal fall arrest systems will be used in hoist areas when an employee may fall six (6) feet or more. If guardrail systems must be removed for hoisting, employees are required to use personal fall arrest systems.

8.1.3 Holes:

- a. Covers or guardrail systems shall be erected around holes.

8.1.4 Leading Edges:

- a. Guardrail systems, safety net systems, or personal fall arrest systems shall be used when employees are constructing a leading edge that is six (6) feet or more above lower levels. An alternative Fall Protection Plan shall be used if the **Safety Department** determines that the implementation of conventional fall protection systems is infeasible or creates a greater hazard to employees. All alternative Fall Protection Plans for work on leading edges shall:

1. Be written specific to the particular jobsite needs.

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2. Include explanation of how conventional fall protection is infeasible or creates a greater hazard to employees.
3. Explain what alternative fall protection will be used for each task.
4. Be maintained in writing at the jobsite.
5. Meet the requirements of 29 CFR 1926.502(k).

8.1.5 Steep Roofs:

- a. Guardrail systems with toeboards, safety net systems, or personal fall arrest systems will be provided to employees working on a steep roof with unprotected sides and edges six (6) feet or more above lower levels.

8.1.6 Wall Openings:

- a. Guardrail systems, safety net systems, or a personal fall arrest system will be provided to employees working on, at, above or near wall openings when the outside bottom edge of the wall opening is six (6) feet or more than 39 inches above the walking / working surface.

8.1.7 Runways, and Other Walkways:

- a. Employees using ramps, runways, and other walkways six (6) feet or more above the lower level shall be protected by guardrail systems.

9. PROTECTION FROM FALLING OBJECTS:

- 9.1 When guardrail systems are in use, the openings shall be small enough to prevent potential passage of falling objects. The following procedures must be followed by all employees to prevent hazards associated with falling objects.
 - 9.1.1 No materials (except masonry and mortar) shall be stored within four (4) feet of working edges.
 - 9.1.2 Excess debris shall be removed regularly to keep work areas clear.
 - 9.1.3 Stacked materials must be stable and self-supporting.
 - 9.1.4 Canopies shall be strong enough to prevent penetration by falling objects.

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9.1.5 Toeboards erected along the edges of overhead walking / working surfaces shall be:

- a. Capable of withstanding a force of at least 50 pounds; and solid with a minimum of three and a half (3 ½) inches tall and no more than one quarter (1/4) inch clearance above the walking /working surface.

9.2 Equipment shall not be piled higher than the toeboard unless sufficient paneling or screening has been erected above the toeboard.

10. RESCUE:

10.1 A rescue plan shall be developed when employees are exposed to fall hazards and the possibility exists for the deployment personal fall arrest systems. Prompt rescue is critical in order to minimize the risk of serious injury to fallen personnel.

10.1.1 Employees shall be instructed in the methods self rescue. These methods may include:

- a. Rescues from ladder.
- b. Rescues from scissor lift.
- c. Rescues from boom lift.

10.1.2 The rescue plan shall also include the method to summons external emergency medical services for assistance in the event self rescue is not effective or appropriate should the employee become injured during the fall.

11. ACCIDENT INVESTIGATIONS:

11.1 All incidents that result in injury to workers, as well as near misses, regardless of their nature, shall be reported and investigated. Investigations shall be conducted by the **EH & S Manager** as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence.

11.2 In the event of such an incident, the Fall Protection Program (and alternative Fall Protection Plans, if in place) shall be re-evaluated by the **EH & S Manager** to determine if additional practices, procedures, or training are necessary to prevent similar future incidents.

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12. CHANGES TO THE PLAN:

- 12.1 Any changes to the Fall Protection Program (and alternative Fall Protection Plans, if in place) shall be approved by the **EH & S Manager**, and shall be reviewed by a qualified person as the job progresses to determine additional practices, procedures or training needs necessary to prevent fall injuries. Affected employees shall be notified of all procedure changes, and trained if necessary. A copy of this plan, and any additional alternative Fall Protection Plans, shall be maintained at the jobsite.

13. GLOSSARY:

- 13.1 **Anchorage**: a secure point of attachment for lifelines, lanyards, or deceleration devices.
- 13.2 **Body belt**: a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
- 13.3 **Body harness**: straps that may be secured about the person in a manner that distributes the fall-arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with a means for attaching the harness to other components of a personal fall arrest system.
- 13.4 **Connector**: A device that is used to couple (connect) parts of a personal fall arrest system or positioning device system together.
- 13.5 **Controlled access zone**: a work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems (guardrail, personal arrest, or safety net) to protect the employees working in the zone.
- 13.6 **Deceleration device**: any mechanism, such as a rope, grab, ripstitch lanyard, specially-woven lanyard, tearing lanyard, deforming lanyard, or automatic self-retracting lifeline/lanyard, which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limits the energy imposed on an employee during fall arrest.
- 13.7 **Deceleration distance**: the additional vertical distance a falling person travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which a deceleration device begins to operate.
- 13.8 **Guardrail system**: a barrier erected to prevent employees from falling to lower levels.
- 13.9 **Hole**: a void or gap two (2) inches (5.1 centimeters) or more in the least dimension in a floor, roof, or other walking/working surface.
- 13.10 **Lanyard**: a flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body belt or body harness to a

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deceleration device, lifeline, or anchorage.

- 13.11 **Leading edge**: the edge of a floor, roof, or formwork for a floor or other walking/ working surface (such as a deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed.
- 13.12 **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), that serves as a means for connecting other components of a personal fall arrest system to an anchorage.
- 13.13 **Low slope roof**: a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
- 13.14 **Opening**: a gap or void 30 inches (76 centimeters) or more high and 18 inches (46 centimeters) or more wide, in a wall or partition through which employees can fall to a lower level.
- 13.15 **Personal fall arrest system**: a system including but not limited to an anchorage, connectors, and a body harness used to arrest an employee in a fall from a working level.
- 13.16 **Positioning device system**: 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 backwards.
- 13.17 **Rope grab**: a deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall.
- 13.18 **Safety monitoring system**: a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
- 13.19 **Self-retracting lifeline/lanyard**: a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under minimal tension during normal employee movement and which, after onset of fall, automatically locks the drum and arrests the fall.
- 13.20 **Snaphook**: a connector consisting of a hook-shaped member with a normally closed keeper, or a similar arrangement, which may be opened to permit the hook to receive an object and, when released automatically, closes to retain the object.
- 13.21 **Steep roof**: a roof having a slope greater than 4 in 12 (vertical to horizontal).
- 13.22 **Toeboard**: a low protective barrier that prevents material and equipment from falling to lower levels and which protects personnel from falling.
- 13.23 **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 meter) high.

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- 13.24 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. Does not include ladders, vehicles, or trailers on which employees must be located to perform their work duties.
- 13.25 Warning line system:** a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.