11.1 Policy Statement

Fall hazards create one of the greatest exposures to injury on any job site. These hazards include falls from elevations, falls from the same level, and being struck by falling objects. A fall hazard is created when activities expose an employee to an unprotected fall that may result in injury or death.

The most common hazard, falls from elevation, generally includes falls from ladders, elevated workplaces, floor openings, and unprotected leading edges. Falls on the same level are usually caused by slipping and tripping hazards. Incidents involving falling objects are caused by objects that are improperly stored, disposed of, or mishandled at elevations.

Since our employees are what make All States Materials Group the successful company it is, these policies and procedures have been developed to ensure that each and every employee is able to go home at the end of each day to join their loved ones.

The goal of this Fall Protection Program is to prevent the occurrence of falls from elevations of 6’ or higher in construction or 4’ or higher in general industry. This goal will be accomplished through effective education, engineering, and administrative controls, use of fall protection systems, and general enforcement of the program.

11.2 Identifying Fall Hazards

- Effectively preventing falls requires identifying, evaluating, and controlling the fall hazards most likely to cause an accident/incident. This effort can only be accomplished by identifying potential fall hazards prior to each project and daily inspections during a project, paying close attention to hazards associated with routine and non-routine tasks.
    - Site Inspections/Job Hazard Analysis: Select both workers and their supervisors to identify elevated work locations and the activities performed at those locations.
    - Videotaping or photographing of fall hazards is an excellent means to identify and evaluate the potential hazards.

11.3 Fall Prevention

- Fall prevention is any means used to reasonably prevent employee exposure to fall hazards by eliminating work at elevations by using aerial lifts, scaffolds, elevated work platforms with guardrails, or similar protection.
- The key to fall protection is to develop a plan, prior to performing the work, designed to eliminate exposures to fall hazards. Fall prevention involves an analysis of each activity that exposes employees to potential fall hazards. Based on the results of the analysis, attempt to eliminate the need for fall protection by rescheduling the task, isolating the task, or changing the task. The primary objective during the planning phase of any activity should be eliminating the need for personal fall arrest equipment by instituting fall prevention controls that eliminate fall hazards.
- It shall be the policy of All States Materials Group to provide engineering controls to eliminate the fall hazard before the use of personal fall arrest systems. Selecting the appropriate fall prevention

measures can only be determined after assessing the location of work and the type of construction activity performed.

- Question whether the activity can be performed without employee exposure to a fall hazard.
- Implement engineering controls into the design process by interacting with designers, fabricators, and material suppliers to build safety measures into the structure, material, or equipment utilized during the construction process;
- Maximize the pre-assembly of structural components on the ground. Use mechanical pin extractors to disconnect rigging from the ground. Design holes and/or attachments for stanchions, lifelines, and retractable devices on structural components to permit assembly on the ground and to provide protection at elevation.
- Include correct installation and proper use of ladders, scaffolds, stair towers, and stairways. Attach fall arrest systems, such as horizontal lifelines to bridge steel and form work before erection to facilitate safe access.
- Providing proper access.
- Providing guardrail protection.
    - Designate work locations requiring guardrail protection: elevated work platforms, scaffolds, opening holes in bridge decks, floors or other unprotected surfaces, and unprotected sides of ramps, stairs, and platforms.

11.4 Fall Protective Systems

Anytime an employee is exposed to a fall of 4’ (shop, warehouse, or yards) 6’ (on construction sites only), and any time there is potential for a fall under MSHA Standards, they shall be protected from falling to the lower level by either a guardrail system, covers, or personal fall arrest system. The appropriate fall protection shall be determined by a competent person, according to the task (job) to be performed.

11.4.1 Types of Fall Protection Systems:

- Guardrail with a toe board, mid rail, and top rail;
- Personal fall arrest systems:
    - Anchor points (rated at 5000 pounds per person),
    - Full body harness,
    - Decelerating lanyard, Retractable lanyard or Shock Absorbing Lanyard.
    - Rope grabs;
    - Connectors (self-locking snap hooks);
    - Engineered lifelines;

- An articulating man lift provided with a restraint system and full body harness to a manufactured and designated anchor point below the waist (preferably at the floor level);
- Warning lines;
- Safety nets;
- Safety monitors system.

11.4.2 Guardrail System

- A guardrail system shall consist of the following components:
  - A top rail placed at 42" (+/- 3") above the walking/working surface that is designed to withstand a downward and/or outward force of 200 pounds. The top rail can be made from 2x nominal lumber with 2x nominal uprights to be spaced at intervals not to exceed 6'. Wire rope can also be used provided it provides the same level of protection and is tight – not more than a 3" deflection is permitted. 1 ½" nominal pipe can also be used.
  - A mid rail placed at 21" above the walking/working surface that is designed to withstand a downward and /or outward force of 150 pounds. This rail can also be made from the above mentioned materials.
  - A toe board is placed at the walking/working surface not more than ¼" from the walking/working surface. The toe board must be a minimum of 3 1/2" in height and be high enough to contain the tools, materials, etc. from falling to the lower level. The toe board must be able to withstand an outward pressure of 50 pounds.
  - The guardrail must be free of defects or protrusions that could cause injuries from punctures or lacerations and could snag a worker's clothes. Railings shall not overhang so much as to cause a hazard to employees.
  - 2x nominal lumber, 1 ½" pipe, 3/8" wire rope, etc. are acceptable materials to use for a guardrail system. Plastic banding or steel banding cannot be used.

11.4.3 Inspection of a Guardrail System

- Temporary systems. Daily visual inspection will be completed by a competent person;
- Temporary systems. A complete weekly structural inspection will be completed by a competent person;
- Permanent systems. Annual structural inspections will be completed by a competent person with future frequency of inspection based on conditions/controls present.

11.4.4 Personal Fall Arrest System

- A Personal Fall Arrest System is used to reduce the possibility of injuries or death as a result of a fall.
  - A fall arrest system includes the proper anchorage, full body harness (harness), and connecting mechanisms (lanyards/lifelines) that are interconnected and rigged to arrest a free fall of 6'

(maximum freefall allowed) or less. The primary function of a fall arrest system is to minimize the consequences of a fall rather than preventing its occurrence. The use of fall arrest equipment should be recognized as a way to minimize injuries sustained from a fall; it does not prevent the fall.

- A variety of fall arrest equipment is available to establish an effective fall arrest system. This equipment must include:
  - Full body harness,
  - Decelerating or Retractable Lanyard,

11.4.5 Personal Fall Arrest System Requirements

- All employees on any project that requires the wearing of a personal fall arrest or restraint system will follow these requirements:
  - A full body harness will be used at all times;
  - Only shock absorbing (also known as decelerating lanyards) lanyards or retractable lanyards are to be used to maintain impact forces at a minimum on the body;
  - Only nylon rope or nylon straps with locking snap hooks are to be used for restraints;
  - All lanyards will have self-locking snap hooks;
  - The employee will inspect all personal fall arrest equipment before each use. Any deteriorated, bent, damaged, impacted, and/or excessively worn harnesses will be removed from service.
  - The maximum free fall distance is not to exceed 6 feet. Consideration must be given to the total fall distance. The following factors can affect total fall distance:
    - Length of connecting means (i.e., lanyard length, use of carabineers, snap hooks, etc.);
    - Position and height of anchorage relative to work platform/area (always keep above the head whenever possible);
    - Position of attachment and D-ring slide on the full body harness;
    - Deployment of shock absorber (max. 42 inches);
    - Movement in the lifeline;
    - Initial position of worker before free fall occurs (i.e., sitting, standing, etc.).
    - Calculating Total Fall Distance: It is the total length of shock absorbing lanyard + height of the person + the location distance of the D-ring from the work surface or platform.
  - Always allow a minimum of 6 feet of clearance above the ground, equipment, etc., at the end of the fall from the fall arrest point.

- If the fall distance is 18.5 feet or less, a retractable lanyard must be used versus a shock absorbing lanyard.

- An anchorage point is a secure point of attachment for lanyards, lifelines, or deceleration devices capable of withstanding the anticipated forces applied during a fall. This point should be located above the worker to avoid unnecessary swing in the event of a fall and can support 5,000 pounds. Adequate anchorage points shall be engineered by a qualified person.
    - Lanyards must never be wrapped around pipes, railings, etc., and connected back onto the lanyard as an anchorage unless it is specially designed as a tie-back lanyard.
    - Selecting adequate anchorage points require evaluating the following characteristics:
        - **Height:** The primary consideration in determining anchorage point height is minimizing free fall to the shortest distance possible, and not hitting any objects or the work surface below. The shorter the fall the less impact force experienced during the fall arrest.
        - **Clearance:** The total fall distance must be determined to ensure that the height and location of the anchorage is sufficient to prevent collision injury with the ground and other objects.
        - **Identification:** Anchorage points must be identified by a qualified person. Employees should be educated about what is and what is not considered acceptable anchorage. When practical, anchorages should be labeled (by painting or hanging flags on or near the approved locations) so workers know exactly where to secure proper anchorage.

11.4.6 Inspection of Personal Fall Arrest Systems:

- The following criteria shall be utilized to maintain all equipment in good working condition:
    - **Full Body Harnesses**
        - Inspect before each use:
        - Closely examine all of the nylon webbing to ensure there are no burn marks, which could weaken the material;
        - Verify there are no torn, frayed or broken fibers, pulled stitches, or frayed edges anywhere on the harness;
        - Examine the D-ring for excessive wear, pits, deterioration, or cracks;
        - Verify that buckles are not deformed, cracked, and properly operate;
        - Check to see that each grommet (if present) is secure and not deformed from abuse or a fall;
        - The harness should never have additional punched holes;

- All rivets should be tight and not deformed;
- Check tongue/straps for excessive wear from repeated buckling;
- Storage will consist of hanging in an enclosed cabinet, to protect from damage;
- All harnesses that are involved in a fall/impact loading will be removed from service until determined to be in safe working condition, or be destroyed if not safe, by a competent person.
- A competent person will complete an annual inspection of all harnesses and will maintain documentation (see form in Appendix);

- **Lanyards/Shock Absorbing Lanyards**
  - Inspect before each use:
  - Check lanyard material for cuts, burns, abrasions, kinks, knots, broken stitches and excessive wear;
  - Inspect the snap hooks for distortions in the hook, locks, and eye;
  - Check carabineers for excessive wear, distortion, and lock operation;
  - Ensure that all locking mechanisms seat and lock properly;
  - Once locked, locking mechanism should prevent hook from opening;
  - Visually inspect shock absorber for any signs of damage, paying close attention to where the shock absorber attaches to the lanyard;
  - Verify that points where the lanyard attaches to the snap hooks are free of defects;
  - Store hanging in an enclosed cabinet to protect from damage;
  - All lanyards that are involved in a fall will be destroyed.
  - A competent person will complete an annual inspection of all lanyards and will maintain documentation (see form in Appendix).

- **Snap hooks:**
  - Inspect before each use:
  - Inspect snap hook for any hook and eye distortions;
  - Verify there are no cracks or pitted surfaces;
  - The keeper latch should not be bent, distorted, or obstructed;
  - Verify that the keeper latch seats into the nose without binding.
  - Verify that the keeper spring securely closes the keeper latch;

- Test the locking mechanism to verify that the keeper latch locks properly;
- All snap hooks involved in a fall will be destroyed.
- A competent person will complete an annual inspection of all snap hooks and will maintain documentation (see form in Appendix).

- **Self-Retracting Lanyards/Lifelines:**
  - Inspect before each use:
  - Visually inspect the body to ensure there is no physical damage to the body;
  - Make sure all nuts and rivets are tight;
  - Make sure the entire length of the nylon strap/wire rope retracts freely and is free from any cuts, burns, abrasions, kinks, knots, broken stitches/strands, and excessive wear;
  - Test the unit by pulling sharply on the lanyard/lifeline to verify that the locking mechanism is operating correctly;
  - If the manufacturer requires, make certain the retractable lanyard is returned to the manufacturer for scheduled annual inspections;
  - A competent person will conduct monthly inspection of all self-retracting lanyards/lifelines and will maintain documentation (see Appendix 4).
  - Service per manufacturer specifications (1–2 years);
  - Inspect for proper function after every fall; if damaged, destroy.
- **Tie-Off Adapters/Anchorages:**
  - Inspect for integrity and attachment to solid surface (capable of supporting at least 5000 lbs. /person).
  - A competent person will complete an annual inspection of all tie-offs and anchorages and will maintain documentation.
  - All tie-offs and anchorages that are involved in a fall/impact loading will be removed from service until determined to be in safe working condition by a competent person.

11.4.7 Engineered Lifeline

- These must be designed and approved by an engineer or qualified person.
- Lifeline systems must be engineered to have appropriate anchorages and strength designed to safely arrest all persons connected to it.

11.4.8 Covers

- Any hole that is at least 2" in its least dimension shall be protected so a person cannot fall through or trip in the hole. This protection can either be a guardrail system or cover.
    - Covers must follow the following criteria:
        - Covers over roadways/travel ways must be capable of supporting without failure twice the maximum axle load of the largest vehicle expected to pass over the cover.
        - All other covers must be capable of supporting without failure twice the weight of employees, equipment, tools, materials, etc. that is expected to pass over the cover.
        - All covers shall be secured to prevent displacement.
        - All covers shall be marked with high visibility paint with the words either **"COVER"** or **HOLE".**

11.4.9 Inspection & Maintenance:

- Fall protection systems and equipment must be inspected and maintained regularly.
- Inspection and maintenance procedures apply to guardrail protection, aerial lifts, covers and barricades for openings, and of personal fall arrest equipment and devices including safety nets.
- Because these systems and equipment are designed to prevent serious or fatal injury, visual inspections of the systems shall be performed before each use and regular periodic inspections by a Competent Person shall be performed in accordance with the manufacturer's guidelines and/or at least on an annual basis.
- Preventative maintenance and general maintenance shall be performed as needed and should be performed in accordance with the manufacturer's guidelines.

11.5 Storage and Maintenance of Personal Fall Arrest Equipment

- Never store the personal fall arrest equipment in the bottom of a toolbox, on the ground, or outdoors, where it will be exposed to the elements (i.e., sun, rain, snow, etc.);
- Hang equipment in a cool, dry location in a manner that retains its shape; Always follow manufacturer recommendations for inspections;
- Clean with a mild, non-abrasive soap and hang to dry;
- Never force dry or use strong detergents in cleaning;
- Never store equipment near excessive heat, chemicals, moisture, or sunlight; Never store in an area with exposures to corrosive chemicals;
- Avoid dirt or other types of build-up on equipment;
- Never use this equipment for any purpose other than personal fall arrest; Once exposed to a fall, remove equipment from service immediately.

- Retractable lanyards must always be stored with the lanyard fully retracted.

11.6 Fall Rescue and Emergency Response

- ASMG will ensure prompt rescue of any employee who experiences a fall while using fall protection systems. Rescue operations must begin immediately using equipment and personnel that are available on-site before any elevated work begins. In situations where it is feasible, employees may perform self-rescue if they are capable of doing so safely.

- Rescue equipment, such as descent devices, ladders, or mechanical retrieval systems, must be readily accessible at the work location, appropriate for the specific fall hazard, and kept in good working condition through regular inspection and maintenance. Designated personnel responsible for rescue must be capable of performing the necessary procedures using the equipment provided. ASMG does not rely on external emergency services for fall rescue and must ensure that internal resources are in place and ready to respond without delay.

11.7 Training

- Effective training remains the cornerstone of any effective safety program. Pursuant of this belief, each employee shall be trained in the following appropriate areas relative to fall protection:
    - The nature of the fall hazards in the employee's work area.
    - The correct procedures for assembling, disassembling, maintaining, inspecting, storage, and use of the fall protection systems used.
    - The role of each employee in the fall protection plan.
    - The pertinent sections of all protection standards.
    - If it is felt by the employee's supervisor or other manager that the trained employee does not have the understanding and skills required, the employee shall receive remedial training until a full understanding and skill level is achieved.

11.8 Definitions

- **Anchorage:** A secure point of attachment for lifelines, lanyards, or deceleration devices capable of withstanding the anticipated forces applied during a fall.

- **Body belt:** A work-positioning safety belt designed to fit around a worker's waist and used in conjunction with a lanyard, lifeline, or rebar assembly. Body belts (single or double D-ring) are designed to restrain a person in a hazardous work position and to reduce the possibility of falls. For positioning only—they shall not be used when a fall potential exists.

- **Body harness**: A harness consisting of multiple straps that are arranged and assembled for the purpose of providing body support during and after a fall arrest. The body harness is designed to distribute arresting forces over the body.

- **Competent person:** An individual knowledgeable about fall protection equipment and systems, including the manufacturer's recommendations and instructions for their proper erection, use, inspection, and maintenance. This person is capable of identifying existing and potential fall hazards and has the authority to take prompt, corrective action to eliminate those hazards.
- **Fall arrest system:** Includes the proper anchorage, body harness , and connecting device (lanyards/lifelines) interconnected and rigged to arrest a free fall.
- **Fall hazard:** Occurs during any construction activity that exposes an employee to an unprotected fall that may result in injury.
- **Fall prevention:** Any means used to reasonably prevent exposure to an elevated fall hazard, either by eliminating work at elevation or by using aerial lifts, scaffolds, floors, guardrails, or isolating an area.
- **Fall protection work plan:** A written plan in which the company identifies all areas on the job site where a fall hazard exists. The plan describes the methods of fall protection necessary to protect employees and includes safe work practices required during the installation, use, inspection, and removal of the fall protection method selected.
- **Fall restraint system:** An approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from the exposure of falling to a lower level.
- **Full body harness:** A body support configured of connected straps to distribute a fall arresting force over at least the thighs, shoulders, and pelvis. The harness provides a D-ring for attaching a lanyard, lifeline, or deceleration device.
- **Horizontal lifeline:** Provides an attachment for the worker's lanyard or other fall arrest device to protect him while moving horizontally and to control dangerous swing falls. It may be a cable or wire rope that is installed horizontally and that serves as an anchoring line rigged between two or more fixed anchorages on the same level. Horizontal lifelines should ideally be positioned above waist height on a worker and all horizontal lifelines and their installations should be approved and supervised by a qualified person.
- **Lanyard:** The connecting means (rope, webbing) used to attach a harness to a lifeline or an anchorage point. Lanyards are usually 2, 4, or 6 feet long and come with or without a shock absorber. Only shock absorbing lanyards shall be used for personal fall arrest.
- **Leading edge:** The advancing edge of a floor, decking, or forms work that changes location as additional sections are placed. Leading edges not actively under construction are considered to be unprotected sides and edges and appropriate methods of fall prevention shall be required to protect exposed workers.
- **Qualified person:** One who by education, experience, and/or training is knowledgeable with the operation to be performed and the hazards involved. The design of fall arrest systems must be engineered by a qualified person.

- **Rope grab:** A fall arresting device that provides employees protection while moving in the vertical direction (climbing). Rope grabs are designed to move up or down a vertical lifeline that is suspended from a fixed overhead point. The vertical lifeline is independent of the work platform and is attached to a harness by a rope grab and lanyard. In the event of a fall, the rope grab locks onto the lifeline to arrest the fall. The use of a rope grab device is ideal for fall protection during work from two-point suspension scaffolds and high vertical fixed ladders
- **Safety Monitor Systems:** A system used in conjunction with a warning line system. A competent person is assigned, as his/her sole duty, to monitor the proximity of workers to fall hazards.
- **Safety Nets:** Used to provide passive fall protection under and around an elevated work area.
- **Self-retracting (retractable) lifeline:** A deceleration device that contains a drum- wound line that may be slowly extracted from or retracted onto the drum under slight tension during normal employee movement and that after onset of a fall, automatically locks the drum and arrests the fall. This device limits the fall to approximately 18 inches.
- **Shock-absorbing lanyard:** A flexible line of webbing, cable, or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber. The shock absorbing mechanism minimizes the forces distributed to the employee and anchorage points.
- **Unprotected sides and edges:** Any side or edge of a form, deck, floor, or structure where there is no protection from a fall hazard.
- **Warning line system:** A barrier erected on a flat or low sloping elevated working surface to warn employees they are approaching an unprotected fall hazard. The rope, wire, or chain must be flagged at not more than 6-foot intervals with high-visibility material. The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface. The stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches 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 shall have a minimum tensile strength of 500 pounds.