SECTION 20 - WALKING-WORKING SURFACES

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20.1 FALL PROTECTION & ROOF SAFETY

A. Objective

To protect employees, students, and visitors from fall hazards along unprotected sides or edges that are at least four (4) feet above a lower level. This includes but is not limited to employee work like accessing roofs, maintenance activities, and changing lighting in the theater where protection against falls must frequently be considered. Fall arrest systems are often used when fall hazards cannot be controlled by railings, platforms, and/or other means.

B. Scope

This procedure requires fall protection whenever the work is performed in an area that is four (4) feet higher than its surroundings. This does not include work on ladders. See Section 20.2 for Ladder Safety Procedures.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.30 Subpart D and Subpart F Section and Illinois Department of Labor 820 ILCS 225 Health and Safety Act. South Central College Walking/Working Surfaces Plan.

D. Responsibilities

- **Risk Management / Environmental Health and Safety (EHS) Office**
  - Developing, implementing, and administrating the Walking Working Surfaces procedure
  - Conduct risk assessments of walking working surfaces
  - Provide fall protection training to employees who require it
  - Review, update, and evaluate effectiveness of fall protection program as appropriate
  - To provide technical support and any consultation to any department working with fall protection
  - Investigating any injuries related to walking working surfaces

- **Directors Supervisors and Management**
  - Make sure that employees understand and are able to recognize potential fall hazards appropriate to their assigned task
  - Notify EHS of any new employee that requires fall protection training or if any current employee needs a refresher course
  - Evaluate the effectiveness of the program and employee's ability to perform following all rules
  - Ensure that all safety equipment is supplied to employees
  - Notify EHS if anyone on the roof is working in an unsafe manner

- **Employees**
  - Understand when a fall hazard is present and how to minimize their exposure to them
  - Reporting any additional hazards to their supervisor or EHS
  - Comply with procedures outlined in this document
  - Notify supervisor with any questions, equipment requirements, or difficulties
  - Report all accidents, and near misses

- Inspect personal fall protection equipment for signs of damage before each use
- If equipment is damaged or defective, tag item as “DO NOT USE” and immediately report it to your supervisor (Note: Never use damaged or defective machinery, tools, equipment, or personal protective equipment)
- Attend training

E. Definitions

- **Fall Protection:** OSHA defines fall protection as, “any equipment, device, or system that prevents a worker from falling from an elevation or mitigates the effect of such a fall”. Under the rule there is a variety of fall protection options. These options include, but are not limited to:
  - **Guardrails:** A barrier erected along the unprotected or exposed side, edge, or other area of a walking working surface to prevent workers from falling to a lower level. Guardrails should be 42 inches above the floor, include a mid-rail and be able to withstand a force of at least 200 pounds.
  - **Personal Fall Arresting System:** A system that arrests/stops a fall before the worker contacts a lower level. Components of a personal fall arresting system include a body harness, lanyard, lifeline, connector, and an anchorage point capable of supporting at least 5,000 pounds.
  - **Safety Monitor:** A trained person which monitors others as they work on elevated surfaces and warns them of any fall hazards. The Safety Monitor can only monitor the work of another, they themselves are not to perform any other work.
  - **Warning Line Systems:** Warning line systems are made up of ropes installed 15 feet from the roof edge. These lines act as a barrier to prevent those working on the roof from approaching its edges.
  - **Covers:** Covers are fastened over holes in the working surface to prevent falls.

F. Roof Access & Safety

Authorized Personnel

Only authorized and trained employees may access the roof. Students are not allowed to access the roof. The use of roofs on campus buildings is prohibited for social and personal purposes.

Weather Conditions Restrictions

Employees shall only access the roof for emergency situations when weather conditions such as the following exist:

- Wind 25 mph or more
- Lightning
- Tornadoes
- Heavy rain or snow
- Hail or ice
- Poor visibility (at night when lighting is inadequate)

If such conditions threaten while already occupying the roof, exit the roof immediately.

Warning Line System

There is a warning line system that is in place 15 feet from the roof edge. No personal fall arrest system or safety monitor is required when working or walking within the warning line area.

Any access past the warning line system to the roof edge requires either a guardrail in place or personal fall arrest system in place with safety monitor.

Skylights and Hatches

- Skylights shall be guarded by a standard skylight screen or fixed guardrail on all exposed sides.
- Hatches shall be protected with fixed guardrails with gates to prevent falls

Additional Roof Safety

- Work Tools: Secure unused tools on the roof and remove them when the job is complete
- Remove excess materials after the work has been completed to keep roof free of trip hazards.
- Do not throw any objects off the roof.
- Install toe boards, screens and/or guardrails to prevent objects from falling to lower levels
- Keep objects (e.g. products, tools, equipment etc.) far enough from edges, holes, or openings to prevent them from falling to a lower level.
- There shall be no running or horseplay allowed on the roof.

G. Personal Fall Arrest Systems

A personal fall arrest system consists of an anchorage, body harness, and connectors. Personal Fall Arrest Systems may include a lanyard, deceleration devise, lifeline, or suitable combinations of these devices.

When personal fall arrest systems are used, they MUST:

- Be inspected prior to use for wear, damage, and deterioration. Defective components must immediately be removed from service.
- Limit the maximum arresting force on a person to 1,800 pounds when used with a body harness.
- Be rigged so that a person cannot fall more than 6 feet or contact any lower level.
- Bring a person to a complete stop and limit the maximum deceleration distance traveled to 3.5 feet.
- Have sufficient strength to withstand twice the potential impact energy of a person free falling a distance of 6 feet or the free fall distance permitted by the system (whichever is less).
- Sustain the person within the system /strap configuration without making contact with the employee's neck and chin area.

Note: Body belts (safety belts) are prohibited for use as part of a personal fall arrest system.

Personal Fall Arrest System Components

1. D-Rings, Snaphooks, and Carabiners
   - D-rings, snaphooks, and carabiners must be capable of sustaining a minimum tensile load of 5,000 pounds.
   - D-rings, snaphooks, and carabiners must be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or incurring permanent deformation. The gate strength of snaphooks and carabiners must be proof tested to 3,600 lbs. in all directions.
   - Snaphooks and carabiners must be the automatic locking type that requires at least two separate, consecutive movements to open.

- Snaphooks and carabiners must not be connected to any of the following unless they are designed for such connections:

  o Directly to webbing, rope, or wire rope;

  o To each other;

  o To a D-ring to which another snaphook, carabiner, or connector is attached;

  o To a horizontal life line; or

  o To any object that is incompatibly shaped or dimensioned in relation to the snaphook or carabiner such that unintentional disengagement could occur when the connected object depresses the snaphook or carabiner gate, allowing the components to separate.

2. Lifelines and Lanyards (e.g., Horizontal, Vertical, and Self-Retracting)
   - Devices used to connect to a horizontal lifeline must be capable of locking in both directions on horizontal lifelines that may become vertical lifelines.
   - Horizontal lifelines must be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall arrest system maintaining a safety factor of two.
   - When vertical lifelines are used, each person must be attached to a separate lifeline.
   - Vertical lifelines and lanyards must have a minimum breaking strength of 5,000 pounds.
   - Lifelines must be protected against cuts and abrasions.
   - Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses must be made of synthetic fibers. Polypropylene rope must contain an ultraviolet (UV) light inhibitor.
   - Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet or less must be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
   - Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet or less, rip-stitch lanyards, and tearing and deforming lanyards must be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

3. Anchorages
   - Anchorages used for personal fall protection equipment must be independent of any anchorages used to suspend employees or platforms on which employees work. Anchorages used to attach to personal fall protection equipment on mobile work platforms on powered industrial trucks must be attached to an overhead member of the platform, at a point above and near the center of the platform.
   - Anchorages must be:
     - Capable of supporting at least 5,000 pounds for each employee attached; or
     - Designed, installed, and used, under the supervision of qualified person, as part of a complete personal fall protection system maintaining a safety factor of two.

H. Emergency Response

Personal fall-arrest systems save lives from falls, but the harnesses can still subject a person to suspension trauma. Suspension trauma occurs when a person hangs in an upright position with their legs dangling underneath them. As the person hangs in this upright position the harness compresses the leg veins, which reduces blood flow to the heart. The reduction of

blood to the heart causes the suspended person to lose consciousness. Loss of consciousness can occur in only a few minutes, and death can follow shortly afterwards. The person in the fall position should try to move into a seated position if possible. Trauma straps have been added to harnesses, in the event of a fall, when possible, use trauma straps to alleviate the weight from your harness to your legs.

Should a fall occur and the person is suspended CALL 911, do not attempt to rescue or move the person.

- If the person needed rescue is conscious, they can delay suspension trauma by lifting the knees above hip level, pushing against a solid surface if available, flexing or pumping the leg muscles or using a safety step device to provide leg support and enhance blood circulation until rescue is provided.
- Remove all fall protection equipment from service that was subjected to the fall. Provide this equipment to the Supervisor for replacement.

I. Training

Training must include the following:

- How to recognize and minimize fall hazards.
- The nature of the fall hazards in the work area.
- Procedures for erecting, maintaining, disassembling, storing, and inspecting the specific fall protection systems used.
- Use, operation, and limitations of fall protection systems.
- The user's role in fall protection systems.
- How and when to report problems or how to ask questions regarding fall protection.
- Training must be understandable to employees, and provided in a language that is understandable to the employee.
- Retraining is required when there are inadequacies in any employee's knowledge or understanding, as well as, when there are changes in fall protection use or equipment.

20.2 LADDER- SAFE WORK PRACTICES & SELECTION

A. Objective

Portable ladders are used at Harper in a wide variety of settings, both academic and administrative. All ladders pose a fall hazard if proper precautions are not taken. Misuse of ladders can result in serious injuries from falls or, in the case of metal ladders, electrical shock. Substituting other items to gain elevation can be hazardous and is not allowed. Portable ladders must be maintained in good condition at all times, and inspected at regular, frequent intervals. Training is also an important aspect of portable ladder safety and accident prevention.

B. Scope

This procedure has been established to address the requirements for using portable ladders in all departments. This section does not address the OSHA requirements for fixed ladders.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910 Subpart D Sections 21, 22, 25, 26 and Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Ladder Types

- Stepladder (or "A" frame ladder) - A self-supporting portable ladder, non-adjustable in length, having flat steps, and a hinged back, additionally:
    - Shall not be longer than 20 feet.
    - Shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in an open position.
    - Further classified into 3 types based on their use:
        - Type I – Industrial stepladder 3-20 feet, for heavy duty use.
        - Type II – Commercial stepladder 3-12 feet, for medium duty use.
        - Type III – Household stepladder 3-6 feet, for light duty use.

- Single Ladder (or "straight" ladder) – A non-self-supporting portable ladder, non-adjustable in length, consisting of but one section. Its size is designed by overall length of the side rail, additionally:
    - Shall not be longer than 30 feet.

- Extension Ladder – A non-self-supporting potable ladder adjustable in length, additionally:
    - Shall not be longer than 60 feet.

E. Ladder Use Guidelines

The following are a list of guidelines to follow that help prevent accidents when using a portable ladder:

- Use a ladder only for its designated purpose.
- Keep the area around the top and bottom of the ladder clear.
- Wear shoes with nonskid soles that are free of snow, mud, or grease etc. as metal rungs can be very slippery in certain conditions.
- Ladders shall be placed on a stable, level base with a secure footing. Boxes, barrels, or other unstable surfaces should never be used to obtain additional

height. Additionally, ladders should not be placed on slippery surfaces unless secured by holding or lashing.

- Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.
- Short ladders shall never be spliced together to make long ladders.
- Do not load the ladder beyond their maximum intended load or beyond the manufacturer's rated capacity.
- Read and follow the warning labels on all ladders.
- Ensure the ladder is fully extended before starting work and do not move, shift, or extend ladders while in use.
- Do not carry objects or loads that could cause loss of balance and falling.
- Do not stand on the top step of a stepladder, and do not stand any higher than the third highest rung from the top of a straight ladder. This can make the ladder unsteady and leaves the user with no handholds.
- Straight or extension ladders should extend at least 3 feet above the point of support.
- Straight or extension ladders shall be set up using the 1-to-4 rule: the bottom of the ladder should be 1 foot away from the wall for every 4 feet that the ladder rises. For example, if the ladder touches the wall 16 feet above the ground, the feet of the ladder should be 4 feet from the wall.
- Overreaching can also cause instability. A good rule of thumb is to not let one's belt buckle outside the uprights. Also, when climbing or descending ladders, always face the ladder and hold onto each side rail.
- Ladders shall never be used in the horizontal position as scaffolds or work platforms.
- Do not use a ladder as a seat to take a break.
- Prevent passersby from walking under or near ladders in use by using barriers or having a coworker to act as lookout.

F. Care of Ladders

Ladders shall be maintained in good conditions at all times, use the following *20.2.1 Ladder Inspection Checklist* as well as these inspection items:

- The joints between the steps and side rails shall be tight.
- Hardware and fittings shall be secure.
- Moveable parts shall operate freely.
- Metal bearings should be frequently lubricated.
- Frayed or worn rope shall be replaced.
- Safety feet and other auxiliary equipment shall be kept in good repair.
- Rungs shall be kept free of grease and oil etc.
- If tipped over, inspect for dents, bends, rungs, hardware security, or other damage.
- Never paint ladders, as paint may hide defects that could lead to failure.

G. Training

Supervisors should cover the proper use, inspection of, and hazards related to portable ladders. Information should include, this program, applicable OSHA regulations, and manufacturer recommendations on use of specific ladders. This shall include the following topics:

- The nature of fall hazards,
- Correct usage, and
- Load-carrying capacities.

Those who use ladders near exposed electrical conductors shall also receive training in electrical safety-related work practices.

20.2.1 LADDER INSPECTION CHECKLIST

Items to be checked:	Condition O.K.	Needs Repair
GENERAL		
Loose, cracked, bent, or missing steps, braces, or rungs (consider loose if they can be moved by hand).		
Rails cracked, bent, split, or frayed.		
Rust or corrosion on ladder or rivets.		
Labels missing or unreadable.		
Hardware is missing or damaged; loose nails, screws, bolts, or other metal parts.		
Slivers on uprights, rungs, or steps.		
Damaged, missing or worn nonslip bases or shoes.		
STEPLADDERS		
Wobbly (from side strain)		
Loose or bent hinge spreaders.		
Broken Stop on hinge spreaders.		
Loose hinges.		
Pail shelf or top; cracked, loose, bent, missing, or broken.		
EXTENSION LADDERS		
Loose, broken, bent or missing extension locks.		
Defective locks that do not seat properly when the ladder is extended.		
Deterioration of rope or pulley; loose, bent or broken.		
Ladder base or shoes are worn broken or missing.		

If there are any items that "Need Repair" the ladder should immediately be taken out of service, tagged as "Dangerous – Do Not Use" and the responsible supervisor notified. If a ladder cannot be repaired, it should be destroyed.

20.3 AERIAL LIFTS - SAFE WORK PRACTICES & SELECTION

A. Objective

Aerial lifts are considered any of the following: all aerial devices to elevate personnel to work areas not accessible from the ground, including vehicle and non-vehicle mounted lifts with; extendible boom platforms; aerial ladders; articulation booms, vertical towers, and a combination of any such device.

Aerial lifts, like ladders, are also used at Harper in a wide variety of settings, both academic and administrative. The dangers are also similar as ladders with hazards including injuries from falls and electrical shock. Lifts must be maintained in good condition at all times, and inspected at regular, frequent intervals. Individual training is required on the specific aerial lifts.

B. Scope

This procedure has been established to address the requirements for using aerial devices in all departments.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.67 for Aerial devices and 1910.68 for Manlifts. Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Program Requirements

The following is a list of safety requirements for use of all aerial lift devices:

- Only trained and authorized personnel may operate aerial lifts. (Authorization must be from the Supervisor of the Department, see *Section 20.4 Aerial Lift Inventory*).
- Employees shall always stand firmly on the floor of the basket or platform and shall not sit, climb, or lean on the edge of basket or the basket guardrails, nor shall they ever use planks, ladders, or other devices within the basket or platform for positioning.
- A fall protection harness with a lanyard attached to the boom, basket, or platform shall be worn at all times.
- Load limits on the basket or platform shall not be exceeded.
- Outriggers must be positioned on pads or on solid ground and breaks must be set.
- Do not work on slopes that exceed the slope limits listed by the manufacturer. Wheel chocks must be installed before the lift is used when working on an incline.
- Lift controls must be tested daily prior to operating and be clearly marked.
- The lift must not be moved when it is in an elevated position.
- If there is any malfunction or problem with the lift it should be immediately taken from service, tagged, and notify the responsible supervisor.
- The manufacturer, or equivalent, shall certify any modifications.
- The area beneath an operating lift must be cordoned off and access to that area must be restricted, by placing barricades and signs.
- Employees must stay at least 10 feet away from overhead power lines, to prevent electrocution.
- Employees shall not use the lift in wind speeds of 25 or more miles per hour or in inclement weather.

E. Care and Inspection of Aerial Lift Devices

Inspections by the manufacturer or a manufacturer representative shall be conducted annually, coordinated by the responsible supervisor; they shall further keep the inspection records.

F. Training

No person shall operate any aerial lift until they have been trained and certified on that specific lift. Training is required prior to permitting an employee to operate a lift (except for training purposes).

20.3.1 AERIAL LIFT INSPECTION CHECKLIST

Inspector: _____

Date: _____

Aerial Lift Make/Model: _____

Operation Checklist is to be used before EVERY use of the lift:

Items to be checked:	Condition O.K.	Needs Repair
Walk around the lift; look for loose or missing parts or visible damage		
Check controls for correct operation		
Operation is on a smooth, firm, and level surface		
The platform load capacities are not exceeded		
Lifts with outriggers, are positioned properly before raising platform		
The area beneath an operating lift is cordoned off and access to that area is restricted with barricades and signs		
There is at least 10 feet of clearance between any part of the machine and any overhead electrical sources.		

Three Month Inspection

The following checklist should be completed on all aerial lifts every three months. In addition, there are annual inspections made by a manufacture representative.

Items to be checked:	Condition O.K.	Needs Repair
All functions and their controls for speed(s) smoothness and limits of motion;		
Lower controls including the provisions for overriding of upper controls		
All chain and cable mechanisms for adjustment and worn or damaged parts		
All emergency and safety devices		
Lubrication of al moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant as specified by the manufacturer		
Visual inspection of structural components and other critical components such as fasteners, pins, shafts, and locking devices;		
Placard, warnings, and control markings		

If there are any items that "Need Repair" the lift should immediately be taken out of service, tagged as "out of service" and the responsible supervisor notified. Repairs should be made only by a manufacturer's representative.

20.3.2 AERIAL LIFT INVENTORY

Name (Manuf.)	Capacity	Maximum Platform Height	Power Source	Department Responsible	Supervisor to contact for authorization to use	Storage Location
Genie AWP-25S	350 lb. One person	24 feet	Electric	Box Office	Events Management - Manager of Conference and Event Services	J bldg.
JLG30	350 lb. One person	30 feet	Electric	Box Office	Events Management - Manager of Conference and Event Services	R bldg.
JLG30	350 lb. One person	30 feet	Electric	Maintenance	Facilities Management – Maintenance Supervisor	W bldg.
JLG36	300 lb. One person	36 feet	Electric	Maintenance	Facilities Management – Maintenance Supervisor	R bldg.
Skyjack 4626	700 lb. Two person *Extension platform -300 lb. One person	20 feet	Electric	Maintenance	Facilities Management – Maintenance Supervisor	Avante Z bldg.
JLG600	500 lb. Two person	60 feet	Gas	Maintenance	Facilities Management – Maintenance Supervisor	Maint. Garage
JLG19	350 lb. One person	19 feet	Electric	Utilities	Facilities Management – Utilities Supervisor	B bldg.
JLG36	300 lb. One person	36 feet	Electric	Maintenance	Facilities Management – Maintenance Supervisor	M bldg.
JLG E33MJ	500 lb. One person	33 feet	Electric	Maintenance	Facilities Management – Maintenance Supervisor	B bldg.
15 MSP	500 lb. One person –order picker	15 feet	Electric	Shipping & Receiving	Facilities Management – Operations Services Manager	B bldg.

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20.4 SCAFFOLDING- SAFE WORK PRACTICES & SELECTION

A. Objective

There may be the requirement to use scaffolding on campus. If and when any scaffolding is used these safe work practices and selection must be followed as well as all the rules and regulations that apply to erecting, dismantling, fall protection, furnishing, and engaging in work on a scaffold in accordance with OSHA regulation in 1910 and 1926 CFR.

B. Scope

This procedure is established to address the requirements for using scaffolding in all departments.

C. References

Department of Labor, Occupational Health and Safety Administration (OSHA) 29 Code of Federal Regulations 1910.28- Safety Requirements for Scaffolding and 1910.451-454. Illinois Department of Labor 820 ILCS 225 Health and Safety Act.

D. Program Requirements

If it is determined that scaffolding is to be erected, the department supervisor must designate a **competent person** with specialized training to oversee the erecting, securing, and dismantling of the scaffolding. The competent person shall also inspect all scaffolds for visible defects before each work shift and after any occurrence that may affect the scaffolds' structural integrity. The competent person must have a complete grasp of functions, rules, and regulations as they pertain to the scaffold they oversee.

Competent persons will manage the daily activities on and around scaffolds and ensure the following:

- **Capacity**- Scaffolds and scaffold components must be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.
- **Footing**-The footing or anchorage for scaffolds must be sound, rigid, and capable of supporting the scaffold and its maximum intended load without surface settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks must not be used to support scaffold or planks.
- **Planking** – All planking, if applicable, must be overlapped a minimum of 12 inches or secured from movement by nails or bolts, unless the scaffold is prefabricated and interlocking. If nails or bolts are used in the construction of the scaffold they must be of sufficient size and number to secure planks from movement.
- **Fall Protection** – Fall protection is required for any scaffold greater than 10 feet in height. Guardrails, midrails, and personal fall arrest system, when applicable, must be in place when the scaffold is being used by employees.
- **Electrical Safety** – A 10-foot distance rule must be taken into consideration when working near overhead power lines or with any high voltage electrical equipment. (See *Section 10-Electical Safety* for more information).
- **Weather Stoppages** – Work on scaffolds is not allowed during high winds or when ice or snow collects on planking.

E. Training

All employees who are required to erect, work on, or dismantle scaffolds must attend scaffold safety training. The designated competent person must be trained for the specific job as well as on the specific type of scaffolding. Training covers the proper use, inspection of, and hazards relating to erection, working on, and dismantling scaffolds.