



SONOMA STATE UNIVERSITY

Fall Protection Program

Includes Aerial Lift Device and Roof Access Programs

Department of Environmental Health & Safety
Updated June 2023 Version 2

TABLE OF CONTENTS

Record of Revisions..... 4

Introduction..... 5

 Purpose & Scope..... 5

 Reference..... 5

Responsibilities..... 5

 Environmental Health & Safety (EH&S)..... 6

 Supervisors and Managers..... 6

 Employees..... 6

Definitions..... 7

Scope and Application..... 10

Fall Hazard Assessment..... 10

 Fall Protection Hierarchy..... 10

Work Requiring Fall Protection..... 10

Types of Fall Protection Systems..... 11

 Floor and Roof Openings, Covers and Skylights..... 11

 Guardrail Systems..... 12

 Personal Fall Arrest Systems..... 12

 Anchorages..... 13

 Fall Positioning Systems..... 13

 Personal Fall Restraint..... 13

 First-person Up Situations..... 14

Excavations..... 14

Protection from Falling Objects..... 14

Roof Access..... 14

 Building Roof Categories..... 15

 Restricted Access..... 15

 Limited Access..... 15

 Roof Access Annual Conditional Permit..... 16

 Roof Security..... 16

 Emergency Access..... 17

Scaffolds..... 17

Aerial Lift/Mobile Elevating Work Platforms..... 17

 Roles and Responsibilities for AL/MEWP..... 17

 Employees..... 17

 Departments that Own/Use AL/MEWP..... 17

 Responsible Person..... 17

 AL/MEWP Equipment Operators..... 18

 Contractors/Vendors using AL/MEWP on SSU Property..... 18

 Facilities Management/Fleet Program..... 18

 Environmental Health & Safety (EH&S)..... 18

 Types of AL/MEWP..... 19

Extensible Boom Platform.....	19
Scissor Lift.....	19
Vehicle Mounted Lift.....	19
Articulating Boom Lift.....	19
Elevating Work Platform.....	19
Program Requirements/Operator Procedures.....	20
Administrative Requirements.....	20
Identify/Evaluate AL/MEWP Equipment Requirements and Site Hazards.....	20
Inventory Department AL/MEWP Equipment.....	20
Identify Department Personnel Requiring AL/MEWP Training.....	20
Assure Training/Qualification/Retraining of Department Personnel.....	20
Operator Training/Licensing Procedures.....	21
CSU Learn Training.....	21
Field Training and Competency Testing.....	21
Operator Licensing.....	21
Refresher Training.....	22
Operator Safe Work Procedures.....	22
AL/MEWP Selection and Site Hazard Evaluation.....	22
Pre-Operation Inspection and Use of Fall Protection.....	22
Equipment Tag Out.....	23
Operating Procedures and Hazard Identification.....	23
Rescue Plans.....	24
Self-rescue Options.....	25
Assisted Rescue Options.....	25
Technical Rescue.....	26
Equipment Inspection, Maintenance and Storage.....	26
Accident Investigations.....	27
Training Requirements.....	27
Recordkeeping.....	28
Appendix I: Site Specific Fall Protection Plan.....	29
Site Specific Fall Protection Plan.....	30
Introduction.....	30
Weather.....	30
Unique Conditions.....	30
Implementation.....	31
Fall Hazard Identification and Protection Selection Worksheet.....	32
Hazard Type.....	32
Fall Protection System Assembly and Maintenance.....	33

Record of Revisions

Version	By	Date	Description of Revision
0 (Original)	RL	Feb 2019	Complete rewrite of the program
1.0	CG	Aug 2020	Program reviewed, no change to procedural content. Updated document format for standardization.
1.1	MB	April 2022	Program reviewed, no change to procedural content. Updated format and branding. Reviewed program effectiveness with FM manager Utarid, Teamsters representative Greene. FM is updating training for all applicable FM workers with 3rd party vendor. Random review of harness inspection forms for completeness.
2	MB	June 2023	Significant updates to format and organization; combined with Aerial Lift Program and Roof Access Program

Legend:

RL: Ruth LeBlanc, Director of EH&S

CG: Christy Gorman, Safety Manager

MB: Missy Brunetta, Interim Sr. Director for Campus Safety

Introduction

This program describes the procedures and training for Sonoma State University (SSU) employees who are subject to fall hazards due to work performed on elevated surfaces (\geq six (6) feet), including ladders, aerial lifts, and platforms.

Purpose & Scope

The purpose of this program is to provide good practices, procedures, and training to employees who work on elevated surfaces. This program applies to all University employees that perform duties on elevated work surfaces with a potential fall hazard of 4 feet or more. This program focuses primarily on the requirements of OSHA General Industry Standard. Consult with Environmental Health & Safety regarding requirements for OSHA Construction Industry.

Reference

This program is intended to comply with the following Title 8 California Code of Regulations, General Industry Safety Orders:

- [3210. Guardrails at Elevated Location](#)
- [3212 Floor Openings, Floor Holes and Roofs](#)
- [3213 Service Pits and Yard Surface Openings](#)
- [3214 Stair Rails and Handrails](#)
- [3287 Ladders for window cleaning](#)
- [3298 Operations](#)
- [3299 Personal Fall Protection](#)
- [3275 Scaffolds](#)
- [3276 Portable Ladders](#)
- [3277 Fixed Ladders](#)
- [3278 Use of Fixed Ladders](#)
- American National Standards Institute (ANSI), Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components ([ANSI Z359.1-1992](#))

Responsibilities

The following responsibilities apply to general fall protection prevention and related training and programming. Specific responsibilities related to the operation of aerial lifts and elevating work platforms can be found in the **Aerial Lift/Mobile Elevating Work Platforms** section.

Environmental Health & Safety (EH&S)

Environmental Health & Safety is responsible for the following:

- Establish and update the Fall Protection Safety Program
- Provide consultation and training to departments as necessary
- Assist departments in determining when, where, and how fall protection may be applied.
- Assist each department in identifying elevated work areas.
- Assist departments in determining which fall protective system will work best for each elevated work situation.
- Monitoring regulations and best practices related to fall protection and update the plan accordingly.
- Stopping work that is being conducted in a manner inconsistent with this plan or that is inherently unsafe

Supervisors and Managers¹

Supervisors (lead employees) and managers are responsible for the following:

- Identify and maintain records of all areas/tasks/employees who are required to wear fall protection equipment.
- Responsible for ensuring new and existing employees receive fall protection training as applicable to their job duties.
- Maintain training records.
- With the assistance of Environmental Health and Safety, are responsible for identifying elevated work areas and appropriate fall protection measures.
- With the assistance of Environmental Health and Safety, are responsible for determining applicable fall protective measures based on the task/location.
- Stopping work that is being conducted in a manner inconsistent with this plan or that is inherently unsafe

Employees

Employees are responsible for the following:

- Must not use fall protection equipment without prior training
- Follow all appropriate fall protection requirements while performing assigned duties.
- Inspect fall protective equipment prior to each use.

¹ Supervisor and manager are used interchangeably in this plan.

- Report conditions to your supervisor which may lead to falls or conditions that are not in compliance with this program.
- Stopping/refusing work that is being conducted in a manner inconsistent with this plan or that is inherently unsafe

Definitions

Aerial Lift Device: Equipment such as powered platforms, vehicle-mounted elevated and rotating work platforms, extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers and powered industrial truck platforms primarily designed to position personnel.

AL/MEWP: Acronym for “Aerial Lift/Mobile Elevating Work Platform”

Anchor Point: A secure point of attachment for lifelines, lanyards or deceleration (grabbing) devices.

Body Harness (also referred to as Full-body harness): An interconnected set of straps that may be secured about a 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.

Boom: An elevating member, the lower end of which is so attached to a rotating or non-rotating base that permits elevation of the free end in the vertical plane.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.

Counter Weight: The rear section or area of the lift which is usually made of solid steel, and/or combination of steel and the weight of the battery on electric lifts, that counterbalances the boom leverage and basket load.

Data Plate: Manufacturer’s equipment specification and information data, which includes basket load rating/lift capacity, lift heights, vehicle weight, and vehicle attachments. This plate is required to be affixed to all Aerial Lift Equipment by regulatory code. This is the vehicle operator’s primary source of basic information about their vehicle for safe-work and use planning.

Deceleration Device: Any mechanism, such as a rope, grabbing device, rip stitch lanyard, specially woven 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.

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.

Designated Area: A space which has a perimeter barrier erected to warn employees when they approach an unprotected side or edge, and serves also to designate an area where work may be performed without additional fall protection.

Emergency Lowering Means: Any elevating work platform equipped with a powered elevating assembly, and having a platform height exceeding 60 inches, must be supplied with safe means of lowering the basket or platform during an emergency or malfunction.

Fixed Ladder: Any ladder, including an individual rung ladder, which is permanently attached to a structure, building, or equipment.

Guardrail: A vertical barrier erected along the open edges of a floor opening, wall opening, ramp, platform, runway, or other elevated area to prevent falls of persons.

Ladder: A device typically used to gain access to a different elevation consisting of two or more structural members crossed by rungs, steps, or cleats.

Lanyard: A flexible line of rope or strap that generally has a connector at each end for connecting the body harness to a deceleration device, lifeline or anchor point.

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). This serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Limited access: building roofs can be accessed by employees or contractors for short or long-term work. This requires the approval of the Maintenance Manager.

Low Slope Roof: A roof having a slope of less than or equal to 4 in 12 (vertical to horizontal). A roof with approximately a 19.5-degree slope or less.

Lower Controls: Operating controls located on the base of the unit which can be switched to override the basket or platform control during an emergency.

Mast: Part of the lifting mechanism to which the hydraulic lift cylinder or worm drive is attached that supports the basket as it is lifted up and down.

Opening: A gap or void in a wall or partition, through which personnel can fall to a lower level.

Outriggers: Extendable legs that are either manually set in place or, in some cases, hydraulically extended to give added stability to the unit base.

Personal Fall Arrest System (PFAS): A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

Platform: Any personnel carrying device (bucket, basket, cage, stand, tub, or equivalent) which is a component of an aerial device.

Positioning Device System: A 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.

Restricted access: building roofs require the approval of a Facilities Management Supervisor/Manager before any work is performed. All roofs at SSU are restricted access but may be downgraded to limited access once the type of work and control measures have been identified and protective measures have been approved.

Roof access: Going onto a roof by any means.

Rope Grab (grabbing device): A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall.

Scaffold: Any temporary elevated or suspended platform, and its supporting structures, used for supporting employees or materials or both.

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 movement and which, after onset of a fall, automatically locks the drum and arrests the fall (usually within two feet or less).

Snap Hook: A connector consisting 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.

Standard Railing: A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

Tie-Off: A procedure of connecting directly or indirectly to an anchorage point.

Toe Board: A vertical protective barrier affixed to the scaffold or platform floor that prevents tools, material and equipment from falling to lower levels

Unprotected Sides & 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 42 inches high.

Upper Controls: Operating controls located on the basket or work platform of the unit. These controls can only be overridden with the operator's permission or in case of an emergency.

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

Vertical Lifeline: A vertically hanging flexible line for connection to an anchor point at one end that serves as a means for connecting other components of a personal fall arrest system to the anchor point.

Scope and Application

Cal/OSHA uses the general rule that any time a worker is at a height greater than 4-feet, a fall hazard exists. Where a fall hazard exists, steps must be taken to either eliminate the hazard or provide protection against it. This plan covers those conditions in which an employee may be subject to such hazards.

This program also guides all aspects of the Aerial Lift/Mobile Elevating Work Platform Safety Program and applies to all staff who are required to operate Aerial Lift/Mobile Elevating Platforms or who oversee such staff at Sonoma State University.

Fall Hazard Assessment

A supervisor shall evaluate each worksite for fall hazards. All identified fall hazards should be documented with prescribed fall protection measures.

Fall Protection Hierarchy

Solutions for fall protection hazards will be determined in the following order and priority:

1. Eliminate the fall hazard.
 - a. Engineer out the hazard, by installing guardrails or moving equipment to the ground.
 - b. Perform the work from ground level.
2. Use of Fall Restraint Systems.
 - a. Use of positioning devices and a body harness to prevent falls.
3. Use of Personal Fall Arrest Systems.
 - a. Use of Personal Fall Arrest Systems.
 - b. Development of a rescue plan.

Work cannot be performed unless one or more of the listed Fall Protection Hierarchy solutions have been established.

Work Requiring Fall Protection

As a general rule, any construction work that occurs six (6) or more feet above a lower level must involve the use of fall protection. In general industry, work that occurs four (4) or more feet above a lower level requires fall protection. Employees must also use fall protection if there is a danger of falling into or onto hazardous equipment.

A supervisor competent in the use of fall protection shall evaluate the worksite(s) and will determine the specific type(s) of fall protection to be used. The fall protection solutions will meet or exceed Cal/OSHA fall protection requirements. Environmental Health & Safety will provide consultation and approval for any site upon request.

Cal/OSHA has listed construction and general industry work activities that have specific fall protection requirements. The University will provide fall protection that meets or exceeds these requirements.

The SSU Fall Protection Program and required training applies to the following operations and activities:

- Work on all elevated surfaces over 6-feet high including but not limited to: roofs, catwalks, skylights, boilers, chillers, etc.
- Elevated work at over 4-feet above the ground on poles, towers or similar structures.
- Work using elevating personal platforms such as scaffolds, aerial platforms, some scissor lifts, forklift-mounted platforms, cherry pickers, etc.
- Work involving vertical openings including ground level entry into excavations, trenches, holes, pits, vessels, and other confined spaces.
- Work involving vertical openings other than ground level access into vessels and other permit-required or non-permit required confined spaces.
- Work involving fixed ladders exceeding 20-feet in unbroken length if the ladder is not equipped with approved cage protection.
- Work performed on thrust outs or similar locations, such as trusses, beams, purlins, or plates of 4-inches nominal width, or greater, at elevations exceeding 15-feet above ground, water, or floor level below and where temporary guardrail protection is not present.
- Work involving traveling on walkways or bridges over excavations greater than 6-feet in depth and wider than 30-inches shall be provided with standard guardrails.
- Work that exposes an employee to a fall of 7-½ feet or more from the perimeter of a structure, unprotected sides and edges, leading edges, through shaft ways and openings, sloped roof surfaces more than 4:12, or other sloped surfaces steeper than 18.5 degrees requires personal fall arrest, personal fall restraint or positioning systems unless adequately protected in accordance with Title 8 and as described in this program.
- Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system.

Please note these conditions are based on the university's current operations and equipment. Additional specific conditions for fall protection prevention are required by regulations. Please consult with Environmental Health & Safety if new conditions or equipment are part of a project.

Types of Fall Protection Systems

Floor and Roof Openings, Covers and Skylights

To protect employees from falls, every floor and roof opening shall be guarded by a cover, a guardrail, or equivalent on all sides, or employees shall be provided with a personal fall protection system or fall protection plan.

- All covers shall be properly secured to prevent accidental displacement.

- Covers should be color-coded or bear the markings "HOLE" or "COVER". Exception: traditionally marked and installed manhole or utility access covers.
- Floor and roof opening covers shall be able to support the greater of 400-pounds or twice the weight of employees, equipment, and materials that may be imposed on any one square foot of the cover at any time.
- Covers located in roadways shall be able to support twice the axle load of the largest vehicle that might cross them.
- Employees approaching within 6-feet of an unprotected skylight shall be protected from falling by use of an approved cover or guardrail system.

Guardrail Systems

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.

Cal/OSHA specifications shall be followed in the erection of guardrail systems. Some, but not all specifications are listed below²:

- Required for all surfaces more than 30 inches above floor level in/on buildings or 48 inches for other locations (exceptions detailed in the statute)
- Must include a top rail and mid rail
- Vertical height shall be 42" - 45" above the platform surface
- Mid rail shall be approximately halfway between the top rail and the platform floor/base
- Ends of rails shall not overhang the terminal posts
- Toe board must be included when the platform is 6 feet or higher above places employees may work or pass under (exceptions apply) and where tools, equipment, or materials can fall onto employees below
- Top of the toe guard shall not be less than 3 1/2" above the platform

Select lumber shall be used to construct guardrails unless otherwise specified by a certified engineer or architect. The guardrails must be surfaced to prevent injury to employees from punctures, abrasion, or lacerations.

Gates or removable guardrail sections shall be placed across openings of hoisting and loading areas when they are not in use to prevent access.

Personal Fall Arrest Systems

Personal Fall Arrest Systems shall be issued to and used by employees as determined by the appropriate competent person and may consist of anchorage, connectors, body harness, deceleration device, lifeline, or suitable combinations.

Personal Fall Arrest Systems (PFAS) shall:

- Limit the maximum arresting force to 1800-pounds when used with a body harness.
- Be rigged so an employee cannot free fall more than 6-feet or contact any lower level.
- Bring an employee to a complete stop and limit the maximum deceleration distance traveled to 3-½ feet.

² Requirements apply to general industry; construction requirements differ.

- Be strong enough to withstand twice the potential impact energy of an employee free falling 6-feet (or the free fall distance permitted by the system, whichever is less).
- Have an approved attachment point (dee ring) in the center of the workers back near shoulder level or above the wearer's head.
- Be inspected prior to each use for damage and deterioration and be removed from service if damage or defects are detected.
- Contain ropes and straps used in lanyards, lifelines, and harnesses made from synthetic fibers, unless special precautions are required for hot work.
- Utilize an anchorage point capable of supporting 5,000 pounds.
- Meet the design requirements of the OSHA Fall Protection standard and Cal/OSHA.

All components of a PFAS shall meet the specifications of the OSHA Fall Protection Standard and Cal/OSHA, and shall be used in accordance with the manufacturer's instructions.

- The use of non-locking snap hooks is prohibited.
- D-rings and locking snap hooks shall be self-locking and double acting and:
 - Have a minimum tensile strength of 5000-pounds; and
 - Be proof-tested to a minimum tensile load of 3600-pounds without cracking, breaking, or suffering permanent deformation.

Anchorage

Anchorage used for the attachment of personal fall arrest systems must support at least 5000 pounds per person attached and shall be:

- Used under the supervision of a qualified fall protection supervisor.
- Capable of supporting twice the weight expected to be imposed on it.
- Independent of any anchorage used to support or suspend platforms.
- At least higher than the worker's waist.

Fall protection anchors may be installed at intervals as part of a permanent fall protection system. Facilities Management would be responsible for the installation and maintenance of the fall protection anchors. Anyone requiring access to the roof should review the most current inspection record for the anchors to ensure the safety of the system prior to accessing the roof.

Fall Positioning Systems

Body belt or body harness systems shall be set-up so that an employee cannot fall more than 2-feet, and shall be secured to an anchorage capable of supporting twice the potential impact load or 3000-pounds, whichever is greater. Body belts shall not be used for fall arrest. The use of non-locking snap hooks is not permitted.

Personal Fall Restraint

Harnesses and body belts may be used for personal fall restraint. Anchorage points used for fall restraint must be able to support four times the intended load. Restraint devices must be rigged to allow the movement of employees only as far as the edges of the working level.

First-person Up Situations

If access is required to an elevated surface that does not contain any fall protection anchorage, or protected access, the first-person up principle may be used. Only trained and skilled persons, under the direct supervision of the Facilities Management Supervisor/Manager, may access an elevated surface without fall protection for the purpose of installing the necessary fall protection equipment prior to the start of the work activity, where required.

Excavations

Fall protection will be provided to employees working at the edge of an excavation that is 6-feet or deeper. Employees in these areas are required to use the fall protection systems as designated in this program.

- Excavations that are 6-feet or deeper shall be protected by guardrail systems, fences, barricades, or covers.
- Walkways that allow employees to cross over an excavation that is 6-feet or deeper shall be equipped with guardrails.

Protection from Falling Objects

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.

- No materials (except masonry and mortar) shall be stored within 4-feet of working edges.
- Excess debris shall be removed regularly to keep work areas clear.
- During roofing work, materials and equipment shall be stored no less than 6-feet from the roof edge unless guardrails are erected at the edge.
- Stacked materials must be stable and self-supporting.
- Canopies shall be strong enough to prevent penetration by falling objects.
- Toe boards erected along the edges of overhead walking/working surfaces shall be:
 - Capable of withstanding a force of at least 50-pounds; and
 - Solid with a minimum of 3-½-inches tall and no more than one-quarter (1/4) inch clearance above the walking/working surface.
- Equipment shall not be piled higher than the toe board unless sufficient paneling or screening has been erected above the toe board.

Roof Access

Employees and contractors are frequently required to gain access to the roofs at SSU for such tasks as routine maintenance, equipment inspection/maintenance, and roof/gutter repairs. Work may also require employees or contractors to be on roofs for extended periods of time, such as when repairing or replacing roofing or repairing or replacing equipment on roofs. While

some roofs are higher risk than others, accessing any roof on campus presents the inherent risk of a fall.

Building Roof Categories

Due to the inherent risk of fall from any campus roof, all roofs are restricted to those individuals who are trained in fall protection and have a valid business reason to be on the roof. Building roofs will be categorized as restricted or limited access based on the roof conditions and hazards present. The categorization of the roof will determine the conditions and precautions required for access.

Restricted Access

Roofs will be considered as restricted access unless a site-specific safety evaluation has been conducted and it is determined that adequate mitigation measures are in place and that other hazards are limited. ***All roofs classified as "restricted access" require a roof permit be approved prior to non-emergency access by any person.***

The following conditions present limit the roof to "restricted" status, despite site-specific safety considerations:

- Slope exceeding 4/12: roof slope rises 4" for every 12" of run - approximately 18.4 degrees
- Unprotected skylights or protection that would allow a foot or other body part to project through
- Roofs without parapets and without painted or otherwise consistently marked six foot barrier indicating a prohibited zone
- Roofs that contain hazardous materials that prohibit specific activities

Limited Access

Roofs having limited access are categorized accordingly due to the condition on the roof and the type of work being conducted. Limited access roofs are eligible for the issuance of an Annual Conditional Permit. The permit is valid following the completion of:

- Annual Conditional Permit Application (ACPA): The application must be submitted to EH&S and include identification of potential hazards on the roof. All hazards must be eliminated or adequately mitigated for approval.
- Annual site inspection: A site inspection with at least one member of Facilities Management and Environmental Health & Safety to visually verify

Along with the conditions that designate a roof as "restricted access," the roof access ACP may designate working conditions that may not apply to the ACP and require a specific permit.

These include, but are not limited to:

- Work requires the presence of ten or more persons at one time
- Work must take place within 6 feet of an unprotected edge
- Work requires the use of portable ladders on the roof surface
- Work requires the use of a Personal Fall Arrest System

- When the Site-Specific Fall Protection Plan and site inspection indicate specific circumstances or conditions where a permit is required

Roof Access Annual Conditional Permit

Facilities Management or other departments approved by EH&S to access roof surfaces may request a Roof Access Annual Conditional Permit (ACP) to EH&S for any building that meets the minimum requirements (is not subject to a “restricted access” designation) by submitting the application for Annual Conditional Permit. ACP applications may take up to 30 days to process. To ensure continuity of access, permits should be submitted at least one month prior to expiration of the existing permit.

The Director for EH&S will review all applications and provide contingent approval based on the information in the application. The site visit will be conducted by at least a manager from Facilities Management and an EH&S employee. Safety stewards from CSUEU and/or the Teamsters and a subject matter expert from staff may also attend upon request.

ACP’s will include conditions for use, which may include preventive measures, PPE, buddy systems, radio or other check-ins, or other limitations. Failure to comply with conditions may result in discipline (when individual(s) violating conditions or revocation of the permit when systemic failure to comply with the conditions is repeatedly observed).

If, at any time during the permit’s effective period, roof conditions change in a manner that impacts any of the hazard mitigations or if new hazards are introduced, the permit may be immediately suspended by EH&S until a new application can be submitted, evaluated, and approved.

Roof Security

Roof access points will be secured at all times unless work is actively being performed by authorized personnel. Those personnel with elevator access codes (when applicable) are not authorized to share codes with any person without a valid business reason for access and current fall protection training. Access doors must be kept locked and posted with the sign shown below (or a sign with similar content/intent):

WARNING

This roof is designated as

Restricted Access

PERMIT REQUIRED

Facilities Management & EHS approval is required before any access or work can be performed by any person. Call (707) 664-2317 or (707) 664-2100 for access information.

CAUTION

This roof is designated as

Limited Access

Subject to terms for access

All persons accessing this roof without a date specific permit must be familiar with and agree to the Annual Conditional Permit terms and conditions. Call (707) 664-2317 or (707) 664-2100 for permit information.

Emergency Access

In emergency situations, first responders (including police, fire, or medical responders) and others present to perform emergency mitigation or response duties may access roof surfaces without a permit. Such workers are expected to take all necessary precautions and report and respond accordingly to unsafe conditions immediately.

Scaffolds

University employees who work on scaffolds must be knowledgeable of the following:

- The possibilities of electrical hazards, fall hazards and falling object hazards in the work area.
- The correct procedure for erecting, securing, maintaining and disassembling the fall protective systems and falling object protection systems used.
- The proper use/construction of the scaffold.
- The proper handling of materials on the scaffold.
- The maximum load and carrying capacities of the scaffolds.

Aerial Lift/Mobile Elevating Work Platforms

As mandated by Cal/OSHA and other regulatory compliance codes, this program requires departments that own and/or operate Aerial Lifts/Mobile Elevating Work Platforms (AL/MEWP) to train and license personnel who operate their equipment, conduct pre-operation safety inspections and preventive maintenance of the equipment, and adhere to specific safe-work practices whenever using these types of powered industrial equipment.

Roles and Responsibilities for AL/MEWP

Employees³

All SSU employees who are required or requested to operate AL/MEWP, or who must oversee persons operating AL/MEWP, must be knowledgeable of the requirements of this program. All operators are required to be trained in the safe operation of AL/MEWP resulting in 3-year licensure to operate specific types of AL/MEWP equipment.

Departments that Own/Use AL/MEWP

Departments that own, operate, or allow the operation of AL/MEWP at their locations assure that all employee operators in their department have current AL/MEWP licensure. They also must designate a Responsible Person to oversee program implementation within the department and in cooperation with Environmental Health & Safety (EH&S).

Responsible Person

The Responsible Person assures that all aspects of this program are implemented in their department including current operator licensure from EH&S, scheduling training/retraining as needed, and maintaining program training and inspection records.

³ Employees in this section refers to staff, faculty, or management employees of SSU

AL/MEWP Equipment Operators

All Aerial Lift or Elevating Work Platform operators must obtain an Operator's License from EH&S prior to operating AL/MEWP equipment. This license is obtained by successfully completing a two-part "AL/MEWP Safety Training". This includes classroom/online training plus hands-on training followed by documented testing.

Contractors/Vendors using AL/MEWP on SSU Property

Contractor or Vendor employees that have been trained under their company's Aerial Lift/Mobile Elevating Work Platform Safety program, and have SSU's permission, may operate AL/MEWP equipment owned/leased/rented by their employer on SSU premises. Whether the operator is a vendor or contractor, they may be required to show verification that they have been trained and licensed on the specific AL/MEWP equipment being operated. If contractor/vendor employees are found to be unlicensed, all work must stop immediately until properly licensed personnel are present to operate the AL/MEWP equipment.

Facilities Management/Fleet Program

Facility Management Fleet Program manages the implementation and operation of the program, including:

- Coordinates 'hands-on' field training and assessment of Operator trainees.
- Manages program databases and records of Operator Licensure.
- Works with departments to develop training for unique and "department-specific" Aerial Lift/Mobile Elevating Work Platform needs.
- Monitoring of AL/MEWP operations to ensure compliance with training and the program.

Environmental Health & Safety (EH&S)

Facility Management Fleet Program manages this program in conjunction with EH&S. EH&S is responsible for:

- Assuring the program is revised periodically to maintain compliance with codes and regulations as they change, and update as needed.
- Communicating program changes, objectives and requirements to all departments impacted by this program.
- Developing and updating training content as needed.
- Conducts periodic program audits within departments to assure the program is being properly implemented and followed.
- Modifies program content and procedures as needed to improve program effectiveness and ease of implementation and tracking.

Types of AL/MEWP

The following are examples of AL/MEWP. If an alternate type of equipment is considered for use that is not listed here but includes similar capabilities, purpose, and operation, consider this plan to be applicable to its use.

Extensible Boom Platform

An aerial device (except ladders) with an extensible boom. Telescopic booms with personnel platform attachments are considered to be extensible boom platforms.

Fall Protection is required when operating this equipment.



Scissor Lift

A device designed to elevate a platform in a substantially vertical axis. This device can be driven by an operator inside the work platform and is generally designed to carry more than one person.

Fall Protection is required when operating this equipment.



Vehicle Mounted Lift

These devices typically have a bucket in place of a basket, which is designed for one person. Vehicle must have the brakes set, wheels chocked, and outriggers in place while operating this device.

Fall Protection is required when operating this equipment.



Articulating Boom Lift

An aerial device with two or more hinged boom sections.

Fall Protection is required when operating this equipment.



Elevating Work Platform

A device designed to elevate a platform vertically. This device is stationary once setup and cannot be moved.

Fall Protection is required when operating this equipment.



Program Requirements/Operator Procedures

Administrative Requirements

Department management is responsible for purchasing/owning or selecting/leasing the AL/MEWP equipment and must designate the person(s) responsible for implementing the following program requirements. Note that all purchased AL/MEWP must be approved by the Fleet Manager.

Identify/Evaluate AL/MEWP Equipment Requirements and Site Hazards

The department must evaluate and determine hazards through the Site Hazard Assessment and Pre-Operation Inspection forms. The department must ensure during AL/MEWP use, the equipment will safely operate in the department's work environment with the anticipated maximum reach and work platform capacity required. Unusual or potential hazardous locations or operations in a department's work environment are marked with appropriate warnings via signage, stations and operator training and appropriate equipment selection.

Inventory Department AL/MEWP Equipment

The department must conduct and maintain an inventory list of AL/MEWP equipment owned/used by the department. This list is used to identify training needs, equipment maintenance requirements, and to identify and limit equipment to safe use for department business activities. This list is updated periodically as the department procures or retires equipment, and is referenced to determine what equipment requires Operator's Licensing for use. Refer to Attachment 1 for a template that may be used to develop your department's AL/MEWP "Lift Equipment Inventory".

Identify Department Personnel Requiring AL/MEWP Training

The departments must identify specific department personnel and others who are authorized to operate the department's AL/MEWP. This list is used to identify training needs and to identify and limit equipment to safe use for department business activities. This list is updated periodically as the Department manages compliance with this program, when lifting needs and/or equipment changes, and when personnel are enrolled in or leave this program. Refer to Attachment 2 for a template that may be used to develop your department's AL/MEWP Equipment "Licensed Operator List." Enroll personnel in CSU Learn training modules for the Aerial Lift Safety Training online by contacting Human Resources. Online training modules should be completed prior to hands-on training.

Assure Training/Qualification/Retraining of Department Personnel

Cal/OSHA requires that all AL/MEWP equipment operators are enrolled in and receive initial training, and retraining at minimum every three years. Sonoma State University will require the online Aerial Lift training annual and hands-on practical every three years. Refer to the training section of this program for details on training requirements and activities.

Operator Training/Licensing Procedures

Each operator must successfully complete Operator Safety Training prior to operating AL/MEWP equipment. Operators may only use the AL/MEWP equipment type they have been trained and licensed to operate. Training is conducted by a Facilities Management designee (employee or contractor) in a location where such AL/MEWP equipment operation does not endanger property, the trainee, or others. Departments must arrange for their personnel to be licensed by Facilities Management to operate AL/MEWP equipment and notify EH&S of their intention to operate AL/MEWP.

The Facility Management designee ensures that each AL/MEWP operator demonstrates competency to operate AL/MEWP equipment safely and in compliance with Cal/OSHA requirements, as demonstrated by the successful completion of the training and evaluation specified below. Training consists of a combination of written, on-line training, followed by hands-on field training and documented testing that is specific to the AL/MEWP equipment. Please contact Facilities Management at (707) 664-2317 (extension 42317) to arrange training for department personnel.

CSU Learn Training

CSU Learn on-line training includes familiarization with equipment types and components, hazard assessments and mitigation, equipment inspection requirements, and other requirements of this program. Upon successful completion of the on-line training, the trainee will participate in hands-on training in the field. The Learning & Development Coordinator tracks online training records on the University's Learning Management System (LMS). Facility Management and other participating departments will ensure their employees' training is completed in compliance with this program, including passing scores on applicable examinations.

Field Training and Competency Testing

The hands-on training and testing is conducted using a representative piece of AL/MEWP equipment under the direct supervision of the Facilities Management training designee, who has the knowledge, training and experience to train AL/MEWP operators and evaluate their competence. Field training using AL/MEWP equipment includes review of critical vehicle safety, demonstrations performed by the trainer, practical exercises performed by the trainee and observed by the trainer, as well as evaluation of the trainee's successful performance on a standard skills assessment course that is documented for recordkeeping purposes.

Operator Licensing

When the trainee successfully completes all designated components of the training, the Facilities Management training designee, the Fleet Manager, and EH&S certifies that the Operator has been trained and evaluated as required by this program and Cal/OSHA. The license will include the name of the operator, the licensure/training date, the name of the person(s) performing the training or evaluation, and the types (equipment models) of AL/MEWP the operator is/are licensed to operate. The operator's license is limited to those equipment modes listed and is valid for 3 years.

An operator's license must be carried by the operator whenever they are operating an AL/MEWP as part of their position with SSU or when on SSU property. This training must be conducted in alignment with the retraining requirements set by Cal-OSHA, every three years. However, retraining may be required if equipment, job tasks, or environmental conditions change significantly from those when original training took place, or if the operator has been involved in an equipment accident/incident. The operator is responsible for identifying situations where additional/re-training/licensure may be needed and alerting their department manager or EH&S.

Refresher Training

Cal/OSHA requires refresher training to ensure the operator has the knowledge and skills needed to operate AL/MEWP equipment safely when:

- The Operator has been observed to operate the AL/MEWP in an unsafe manner.
- The Operator has been involved in an accident or near-miss incident where equipment malfunction is not determined to be the sole cause.
- The Operator has received an evaluation that reveals that the Operator is not operating the AL/MEWP safely.
- The Operator is assigned to a different type of AL/MEWP that they haven't been trained on.
- A condition in the workplace changes in a manner that could affect safe operation of the AL/MEWP.
- Training content is determined by the AL/MEWP Safety Program Manager/Trainer based upon observed hazards, type of equipment, Department need, and work requirements. If an Operator has previously received training in a topic specified in this program, and such training is appropriate to a new AL/MEWP and/or working conditions, additional training in that topic may not be required, if the Operator has been evaluated and found competent to operate the new AL/MEWP, or in the new working conditions, safely.

Operator Safe Work Procedures

AL/MEWP Selection and Site Hazard Evaluation

Prior to conducting work with an AL/MEWP, an operator conducts a Site Hazard Assessment and a Lift Selection Assessment. These assessments are conducted as environmental hazards and job requirements dictate, but are formally completed by every operator at the beginning of their shift, each time the equipment is utilized, or when working conditions change. These assessments ensure the proper AL/MEWP equipment is selected for the work and that all hazards in the work area are identified and mitigated prior to commencing work. Each lift has a "Pre-operation Inspection Form" and "Site Hazard Assessment Form" that must be used to document the operator's assessment of their work environment and safety of the equipment.

Pre-Operation Inspection and Use of Fall Protection

At the beginning of each work shift, or prior to using AL/MEWP equipment for a new work assignment, the operator conducts a documented pre-operational inspection of the equipment. This inspection is specific to the type of lift equipment. Results of this inspection are documented on inspection checklists. All of the AL/MEWP equipment requires fall protection to

be worn and properly attached to the equipment by the operator of the equipment. The use of fall protection equipment is regulated by Cal/OSHA and outlined in this plan.

Refer to the following program attachments for Pre-Operation Inspection Checklists, Site Hazard Assessment and AL/MEWP Rescue Plan forms. The applicable forms are **required** to be completed prior to utilizing any AL/MEWP equipment.

- Elevating Work Platform Site Hazard Assessment – Attachment 3
- Extensible Boom Platform – Attachment 4
- Scissor Platform Lift – Attachment 5
- Vehicle Mounted Lift – Attachment 6
- AL/MEWP Rescue Plan – Attachment 10

Equipment Tag Out

No AL/MEWP equipment is to be used until any deficiency(s) discovered during the Pre-Operation Inspection are corrected. If a hazardous deficiency is discovered during a Pre-Operation Inspection, the operator alerts their supervisor/manager of the condition, and “tags out” the equipment from being used by controlling all keys for the vehicle, and placing a “Warning Tag” in the area near the controls with the following information:

- Person’s name that has “tagged out” the vehicle and has the keys in their possession as well as their contact information.
- Date vehicle was “tagged out.”
- Reason(s) for “tagging out” the vehicle, including all noted deficiencies. (A photocopy of the completed inspection form may be taped to the basket or steering wheel on a vehicle-mounted lift for this purpose.)
- Name and contact information for the department’s responsible person for implementation of this program.

No repairs are made on any AL/MEWP until the equipment and its components are blocked, tagged, locked out or otherwise made safe for repair work to commence according to application of the SSU Lockout Tagout Program. Rented equipment that has been tagged out will be reported to the owner as soon as practicable.

Operating Procedures and Hazard Identification

Prior to operation at the beginning of each work shift, Operators must review and assess the following equipment/work area conditions:

- Review work areas for hazards, and remove/control them prior to operation.
- Conduct an environmental hazard assessment prior to using AL/MEWP equipment.
- Only use AL/MEWP equipment designed to safely work in the conditions observed.
- Confirm the specific AL/MEWP is suitable to complete the designated task.
- Review operating instructions, warnings, and precautions for the types of AL/MEWP being operated.
- Prior to operation, at the beginning of the work shift, inspect and document the proper function of controls and instrumentation for the equipment. Do they operate correctly?
- Inspect engine or motor operation.

- Inspect steering and maneuvering.
- Familiarize yourself with visibility.
- Inspect basket or platform capacity and equipment stability.
- Complete and document the inspection process using the appropriate inspection form (in "Attachments")
- Check fuel and/or charging of batteries, and refuel/recharge as needed.
- Review and understand equipment operating limitations.
- Review other operating instructions, warnings, or precautions listed in the operator's manual for the types of AL/MEWP that you will operate.
- Alert all persons in the work area of intended work activities and hazards.
- Always face the direction of travel.
- Don't travel horizontally with the platform elevated or extended.
- Don't exceed the basket or platform capacity.
- Position equipment on a firm level surface and minimize blocks or ramps for leveling the AL/MEWP equipment.
- Always set outriggers prior to use if the AL/MEWP is equipped with them.
- Wear proper safety harnesses and only tie-off to the work platform's fall protection tie-off point.
- "Barrier off" the lift swing work-area below the AL/MEWP equipment's work zone.
- Don't climb on guardrails, climb on ladders or stand on other items when working on the platform. Keep feet on the platform.
- Practice good housekeeping when working in and around the platform.
- Never drop or throw objects to or from the work platform.
- Always look below the platform and confirm it's safe to lower the equipment before lowering the equipment.
- Never lean the platform on or against structures.
- Never use the boom to push against something, or try and pull the AL/MEWP equipment along in a horizontal direction.

Rescue Plans

There are situations where an individual may fall or be ejected from the platform, the platform may become entangled, or the machine may experience a breakdown and the operator and any occupants in the platform will require a timely rescue response.

Even a person properly fitted with a full body harness may receive injuries during the fall or begin to experience suspension trauma (blood pooling in their legs) within a very short period of time. Research indicates that suspension in a fall arrest device can result in unconsciousness, followed by death, in less than 30 minutes. According to ANSI Z359.4-6.1, the recommended goal for rescue subject contact is less than six minutes. In the event of platform entanglement or machine breakdown that would prevent the operator from lowering the platform safely to the ground, it is critical to have a plan in place to ensure a timely rescue.

A site hazard assessment will be completed for all work where fall protection equipment will be used or when the risk for fall exists. All assessments will include a rescue plan which must include the following minimum conditions:

- An attendant or coworker must remain in contact with the person using personal fall protection, this can be visual and voice contact or by radio.
- If the worker falls from an elevated surface or aerial lift and is suspended by fall protection equipment, the attendant must be able to immediately contact rescue personnel. This can be accomplished by calling 9-1-1. A manager must be notified after 911 has been contacted or simultaneously by another worker.
- The rescue plan will define, if any, what rescue equipment may be on site or available for rescue. Rescue equipment for suspended workers must be available on site or emergency services will be summoned. Rescue equipment that staff may be trained in are limited to:
 - Aerial lift
 - Ladders
 - Lifting or lowering device
- No work shall be performed where it is not possible to identify an emergency and summon and promptly ensure rescue can occur.
- Employees should only attempt to use equipment and techniques that they have been trained to use.

Along with the minimum conditions, the following options for rescue will be outlined in all rescue plans. Once any degree of rescue is required, a manager should be notified. If emergency services are requested, that request shall be made prior to the call to a manager.

Self-rescue Options

- Platform auxiliary controls: Attempt to use the controls in the event that the primary platform controls stop responding
- Suspension trauma safety straps: These lightweight systems mount onto the side straps of the operator's harness and can be quickly used in the event of a fall or ejection. The straps contained in a case allow the operator to stand up in their harness to relieve the pressure being applied to arteries and veins until they can be rescued.

Assisted Rescue Options

- Primary ground controls: In the case where the operator cannot lower the platform to the ground by means of the primary or auxiliary platform controls, or if the operator has been incapacitated, a person on the ground who has been familiarized on the proper use of the controls may use the primary ground controls to lower the machine.
- Auxiliary ground controls: In the event the primary ground controls are not responding, the person on the ground should attempt to activate the auxiliary ground controls. If all ground controls are not responding, the ground personnel should immediately contact their manager and a qualified mechanic to assess the situation and provide further guidance.

- Use of secondary aerial lift or ladder: Consideration must always be given to the rescue of AE/MEWP occupants if the machine is unable to be lowered for any reason, such as complete machine malfunction or work platform entanglement.

Please note that any of these rescues should only be carried out by appropriately trained personnel.

Technical Rescue

If, at any time, it is known to another employee that self-rescue or assisted rescue options are not possible, may be time-delayed, or may not succeed, emergency services must be requested while other rescue options are pursued. Even in the event of successful self or assisted rescue, emergency medical services should be summoned when a worker is suspended from fall protection systems. Emergency services are requested by calling 911.

In the event a technical rescue by emergency personnel is required, other workers should be able to relay any known conditions that caused the equipment failure or fall. 911 should be called as soon as it is believed that assistance may be required or that medical support may be necessary.

Equipment Inspection, Maintenance and Storage

As with all personal protective equipment (PPE), the equipment is only protective when it is functioning properly. The same holds true for fall protection equipment.

Fall protection equipment must be visually inspected by the user prior to each use and at least twice annually by a competent person to ensure the equipment is in good working order and ready for use. The date of the most current semi-annual inspection shall be recorded on an inspection tag which shall be attached to the harness. In addition, separate records shall be kept and maintained showing date of purchase, dates when attachments were renewed, and dates when the entire harness assembly was inspected and by whom.

If a fall arrest system is used to control a fall, all affected components of the system must be taken out of service and inspected to ensure they are in functional condition. Some components, such as the shock absorbing lanyard or retractable lifeline, must be returned to the manufacturer for recertification following their use in a fall situation.

Soiled or contaminated body wear (harnesses) can be cleaned in warm water using a mild soap and scrub cloth. The equipment must be thoroughly rinsed with fresh water following any detergent cleaning. Other fall protection equipment can be surface cleaned with water. Harsh chemicals should never be used to clean the fall protection equipment. Upon the completion of cleaning, the equipment must be allowed to dry thoroughly and placed in a clean and dry location to allow for proper storage.

Labels must be visible and legible on all fall protection equipment. If not, they must be removed from service, regardless of equipment condition.

Accident Investigations

All incidents that result in injury to workers, a fall where a fall arrest system is used, failure of a fall protection system or equipment, as well as near misses, regardless of their nature, shall be reported and investigated. Investigations involving elevated work platforms shall be conducted by the Department of Environmental Health and Safety (EHS), a competent fall protection supervisor, and the safety steward for the union (if applicable).

The investigation will occur as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of recurrence.

In the event of such an incident, the Fall Protection Program shall be reevaluated by EHS to determine if additional practices, procedures, or training are necessary to prevent similar future incidents.

Training Requirements

All employees working on elevated work surfaces of 6 feet or more must receive training. All supervisors whose employees work at/on elevated work surfaces and may be required to utilize fall protective equipment/systems shall also receive training. No university employee shall work in areas of high fall hazards or perform duties requiring the use of fall protection devices until they have completed training in fall protection.

Annual training is provided in CSU Learn. Facilities Management will arrange practical training for users of fall protection equipment. Departments with users outside of Facilities Management will be charged back for the direct expense of practical training when provided by an outside contractor or university employee.

A record of employees who have received training and training dates shall be maintained by the appropriate department for 3 years. Records shall be provided to EHS upon request.

Training of employees shall include:

- Nature of the fall hazards employees may be exposed to.
- Correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems.
- The use and operation of guardrail systems, 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;
- Correct procedures for equipment and materials handling, and storage and erection of overhead protection.
- Requirements of the OSHA Fall Protection Standard, 29 CFR 1910 and all Cal/OSHA General Industry Standards related to Fall Protection.

Supervisors shall receive training on the following topics prior to being assigned to supervise employees who work on elevated surfaces:

- The training information required of the employees, detailed above.
- Procedures the supervisor is to follow to implement the provisions of this program.

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.

Recordkeeping

Departments with employees subject to the conditions of the fall protection program are required to keep records demonstrating that the training requirements of this program are maintained for three (3) years. Additionally, all records related to accidents, incidents, or near misses should be maintained for three (3) years. EH&S will keep all investigative records for five (5) years. Any investigation that includes a disciplinary outcome for any employee will be provided to Human Resources, who will maintain such records pursuant to applicable requirements.

Departments with AL/MEWP operators must maintain licensing records for a minimum of three (3) years plus the current year's licenses. Training records (sign in sheets, checklists, and/or other records provided by the training designee) should be maintained for three (3) years as well. While these records may also be maintained by Facilities Management and/or EH&S as well, the department(s) employing licensed users should also maintain licensing records.

Plans associated with work where AL/MEWP are used should be maintained for one (1) year from the date of the end of the job unless the job resulted in injury or EH&S investigation.

Appendix I: Site Specific Fall Protection Plan

This document is intended to supplement the Sonoma State University Roof Access Procedure and provide guidance in the development of a Site-Specific Fall Protection Plan (The Safety Plan). The Safety Plan shall be designed to enable managers and employees to recognize the fall hazards of the campus and establish procedures that are to be followed to prevent falls.

The guidelines presented within this document represent the minimum requirements for development of a complete Safety Plan. The Safety Plan shall: (1) identify the specific locations where work will be performed, (2) include a Fall Hazard Identification and Prevention Worksheet, and (3) provide complete documentation on the details of the chosen fall protection measures. The Safety Plan shall be accepted by Sonoma State University Facilities Management Supervisors/Managers and Dept. of Environmental Health & Safety before work can begin.

It is understood that conditions may change during the course of work that require fall protection measures that deviate from the initial plan. Under these circumstances, the job supervisor shall immediately update the Safety Plan and notify SSU Facility Management and EHS of the changes.

Each employee shall be trained on the fall protection procedures specific to the job and shall strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee shall notify their manager/supervisor of the concern. The concern shall be addressed before proceeding with the work.

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Site Specific Fall Protection Plan

Introduction

This document is intended to supplement the Sonoma State University Roof Access Procedure and provide guidance in the development of a Site-Specific Fall Protection Plan (The Safety Plan). The Safety Plan shall be designed to enable managers and employees to recognize the fall hazards of the campus and establish procedures that are to be followed to prevent falls.

The guidelines presented within this document represent the minimum requirements for development of a complete Safety Plan. The Safety Plan shall: (1) identify the specific locations where work will be performed, (2) include a Fall Hazard Identification and Prevention Worksheet, and (3) provide complete documentation on the details of the chosen fall protection measures. The Safety Plan shall be accepted by Sonoma State University Facilities Management Supervisors/Managers and Dept. of Environmental Health & Safety before work can begin.

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Each employee shall be trained on the fall protection procedures specific to the job and shall strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee shall notify their manager/supervisor of the concern. The concern shall be addressed before proceeding with the work.

Weather

The Safety Plan shall identify the weather conditions under which work will be allowed to proceed. In instances where work must proceed during adverse weather conditions, methods for protecting worker safety shall be documented in the Safety Plan and accepted by SSU managers and employees

In general, sustained winds above 20 miles per hour will be cause for work to stop.

Unique Conditions

Instructions unique to this worksite such as components, placement of systems, anchor points, areas where systems are particularly subject to damage, etc., shall be identified in the Site-Specific Fall Protection Plan.

Roof Edges

The exposed edges of the metal roof panels are sharp. Care must be taken to prevent injury due to contact with the metal edges.

Skylights

The skylights installed on the roofs are not guarded nor designed to support live loads. Proper fall protection measures are required when working within the vicinity of all skylights.

Tripping Hazards

Employees performing work on the roofs will be exposed to multiple tripping hazards due to the inherent construction of the roof and any utilities that may run in any of the valleys of the room. Tripping hazards shall be identified and reviewed by all employees working on the roofs.

Electrical Hazards

A specific Lockout/Tagout plan or procedure must be submitted prior to conducting any electrical work on the roof or on solar panels or their components.

Environmental Hazards

Roof surface or equipment located on the roof may be confirmed to contain hazardous materials, specifically lead, asbestos, or silica. The disruption of such materials may be hazardous to the employee, others on campus, or to the environment. Employees should consult with EHS when disturbing unknown materials, including pressure washing and leaf blowing.

Overhead Hazards

Anytime someone is working above someone else there is the possibility objects may be dropped. That object can be a tool, something that is being worked on, or debris. If the object falls it may cause significant damage or serious injury. Steps that can be taken to reduce injury and damage are:

- Ensure hardhats and safety boots are being worn by all employees above or below the work being performed.
- Mark off the area beneath the work with barricades, signs and caution tape.
- Keep tools and materials away from the edges of roofs, scaffolds or other raised surfaces so they are less likely to fall if bumped or dislodged.
- If prolonged work is being performed on a raised surface, toe boards, screens nets or similar protection will reduce the chances of objects being knocked off.

Implementation

Constant awareness of, and respect for, fall hazards and compliance with all safety rules are a primary consideration when working on Sonoma State University property. It is expected, all employees will follow the tenets of the SSU Roof Access Procedure and accompanying documents to ensure the safety of all affected employees.

The worksheets in the next section will guide managers and employees in designing a Fall Protection Safety Plan.

Fall Hazard Identification and Protection Selection Worksheet

On the table below, identify each fall hazard of 6 feet or more that exists or will exist during this maintenance/construction project and then select the protection method from the options identified below the table.

√	Hazard Type	General Location	Fall Protection Method	Staged Rescue Equip. Required (Y/N)	Overhead Protection Method
	Roof > 4/12 Pitch				
	Roof < 4/12 Pitch				
	Skylight Openings				
	Roof Openings				
	Floor Openings				
	Open-sided Floors				
	Leading Edge Work				
	Mobile Lift Work				
	Other _____				
	Other _____				

Fall Protection Methods: Select a fall protection method from the list below for each hazard identified above. Assembly and implementation instructions for the method(s) used are located elsewhere in this document. It is expected that the most protective method be used as is reasonably possible for the job.

- | | | |
|--|---|--|
| <input type="checkbox"/> Standard Guardrails | <input type="checkbox"/> Fall Arrest System | <input type="checkbox"/> Fall Restraint System |
| <input type="checkbox"/> Warning Line System | <input type="checkbox"/> Safety Net | <input type="checkbox"/> Cover or Hatch |
| <input type="checkbox"/> Warning Line & Safety Monitor | <input type="checkbox"/> Positioning Belt | <input type="checkbox"/> Other: _____ |

Overhead Hazard Protection Methods: For each overhead hazard identified, specify the method(s) of protection for workers below. Refer to the “Overhead Protection” Section of this plan for any special installation instructions.

- | | |
|--|--|
| <input type="checkbox"/> Hard Hats & Safety Glasses Required | <input type="checkbox"/> Screens on Guardrails |
| <input type="checkbox"/> Overhead Hazard Signs | <input type="checkbox"/> Barricade to Control Access to Area |
| <input type="checkbox"/> Debris Nets | Other: _____ |
| <input type="checkbox"/> Toe Boards on Guardrails | Other: _____ |

Fall Protection System Assembly and Maintenance

Fall protection systems (if utilized) will be assembled and maintained according to manufacturer's instructions when using a manufactured system. A copy of those instructions should be available on-site for reference. Any fall protection system used must meet Cal-OSHA regulations.

Standard Guardrails:

- Top rail shall be 42" to 45" above the work surface with midrails and toe board.
- Mid rail shall be halfway between top rail and floor.
- Toe board shall be not less than 3 ½-inches in height.
- Rail Construction, wood:
 - Top rail, hand rail, and posts shall be 2-inch by 4-inch.
 - Midrails shall be at least 1-inch by 6-inch.
- Rail Construction, pipe:
 - Top rail and midrails, and posts shall be minimum 1-1/2-inch nominal diameter, schedule 40.
- Rail Construction, structural steel:
 - Top rail, midrails, and posts shall be at least 2-inch by 2-inch by 1/4-inch angles.
- Posts shall be spaced not more than 6 feet apart.
- Top rail shall be able to withstand 200 pounds force in any direction.
- Mid rail shall be able to withstand 150 pounds force in any direction.
- When the 200-pound test load is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.
- Guardrails shall be inspected regularly for damaged or missing components.

Note: A guardrail does not protect a person standing on a ladder, box, or other surface above the work surface.

Post Material: _____

Rail Material: _____

Post Spacing (8' max): _____

Anchor Method: _____

Other Instructions: _____

Fall Arrest System:

Definition: A system used to arrest an employee in a fall from a working level consisting of (A) a fall arrest anchorage, (B) a full body harness, and (C) a fall arrest connecting device (lanyard, deceleration device, or lifeline).

- Anchor points must be capable of withstanding a 5000-pound shock unless a deceleration device in use limits fall to 2 feet, in which case a 3000-pound anchor point may be used.
- Full body harnesses shall be designed to distribute the fall-arrest forces over thighs, pelvis, waist, chest, and shoulders. Shall be equipped with a circle O-ring at the center of the wearer's back near shoulder level, or above wearer's head.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5000 pounds.

- Self-retracting lanyards shall limit free fall distance to 2 feet or less and shall be capable of sustaining a minimum tensile load of 3,000 pounds with the lifeline or lanyard fully extended.
- Ropes/Straps/Webbing of connecting devices shall be made of synthetic fibers except when in conjunction with hot work.
- System shall limit maximum arresting force on an employee to 1,800 pounds.
- Free fall may not exceed 6' nor contact any lower level.
- Where practicable, anchor end of lanyard shall be secured at a level not lower than the employee's waist.
- Maximum deceleration distance shall be limited to 3.5 feet.
- Lifelines must be placed or protected to prevent abrasion damage.
- Snap hooks may not be connected to each other, or to loops in webbing.
- Snap hooks shall be self-locking.
- Systems shall not be attached to hoists or guardrails.
- Inspect components for deformation, wear, and damage.
- Provisions shall be provided for prompt rescue of employees in the event of a fall.
- Relief Step Safety Devices are highly recommended for employees using fall arrest systems.

System Component List: _____

Anchor Point at this worksite: _____

Configuration and placement sketch attached? Yes _____ No _____

Method of Rescue: _____

Other Instructions: _____

Positioning Belt:

- Employees must not be able to fall more than 2 feet.
- The anchorage must be able to sustain 4 times the intended load.
- Restraint protection shall be rigged to allow the movement of employees only as far as the sides of the working level or working area.
- Snap hooks must not be connected to each other, or to loops in webbing.
- Snap hooks shall be self-locking.

System Component List: _____

Anchor Point at this worksite: _____

Other Instructions: _____

Fall Restraint Harness/Belt:

Anchor points:

- Must withstand 4 times the intended load or 3000 pounds, whichever is greater.
- Must **always** prevent a free fall from the work surface. (Several alternate anchor points may be necessary to achieve this requirement.)
- Inspect components for deformation, wear and damage.

System Component List: _____

Anchor Point at this worksite: _____

Configuration and placement sketch attached? Yes _____ No _____

Other Instructions: _____

Covers or Hatches must:

- Be able to support twice the weight of employees and equipment that would be on it at the same time or twice the maximum axle load of the largest vehicle that would cross it.
- Be secured to prevent accidental displacement.
- Be marked with the word "Cover" or "Hole".

Material to use: _____

Other Instructions: _____

Warning Line Systems must:

- Block access to all fall hazards in the work area.
- Be placed 10 feet back from the edge.
- Be made of rope, wire, tapes or equivalent material and rigged and supported in such a way it is between 39" and 45" above the surface height.
- Be flagged at 6-foot intervals.
- Be marked with high visibility material.
- Be attached to stanchions such that pulling on one section of chain will not take up slack in the other sections.
- Minimum tensile strength of 200 pounds.
- Have stanchions that are able to withstand a 16-pound force applied horizontally at 30" high.

System Component List: _____

Configuration and placement sketch attached? Yes _____ No _____

Other Instructions: _____

Controlled Access Zones must:

- Meet the “Warning Line System” requirements described above, 10’ to 25’ back from the edge *plus the following when employees work between the fall hazard and the warning line (“control zone”).*
- Have a competent person designated as “Monitor” who
 - Wears a high-visibility vest.
 - In visual and voice range of employees in the control zone.
 - Is on the same working surface
 - Has no other duties except watching, warning and directing employees regarding fall hazards.
 - Has a maximum of eight employees working in the control zone (all of whom also wear high-visibility vests and are easily distinguishable from the Monitor).

This system is not to be used in adverse weather conditions such as snow, rain, or high wind, nor after dark.

Monitor(s): _____

Control Zone Employees:

Other Fall Protection System: Provide a description of how the system is to be assembled, disassembled, operated, inspected, and maintained, including specifications for materials to be used in its construction:

Emergencies and Injuries:

First Aid/CPR Trained Employee(s) On Site:

Name: _____

Title: _____

Name: _____

Title: _____

First Aid Kit Location(s): _____

Nearest Medical Facility: _____

Emergency Services Phone Numbers:

Medical: _____ Fire: _____ Police: _____

Location of Nearest Telephone: _____

If a crew member is injured at elevation, the supervisor will evaluate the employee's condition and administer first aid. A rescue plan must be included in this fall protection plan. Emergency services will be called in the event of a medical or fire emergency. If an injured employee can't return to ground level, the employee will be brought down to a lower level by emergency services. The following equipment is available on site to facilitate lowering/rescuing the injured worker:

Employee Training:

All employees must be instructed on the provisions of this plan and have been trained in the proper use of the fall protection equipment involved. By signing this document, the employees acknowledge they understand the plan and have been trained in the use of the equipment.

<u>Name:</u>	<u>Signature:</u>	<u>Date:</u>

The competent person's signature verifies that the hazard analysis has been done, the employees informed of the plan's provisions and that employees have received training in the fall protection systems in use:

Name:	Signature:	Date: