

Fall Protection Program

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REFERENCES

- 8 CCR 1675 General
- 8 CCR 1676 Job Made Ladders
- 8 CCR 1678 Extension Ladders
- 8 CCR 1670 Personal Fall Arrest Systems
- 8 CCR 3276 Use of Ladders
- 8 CCR 3277 Fixed Ladders
- 8 CCR 3278 Portable Wood Ladders
- 8 CCR 3636 to 3648 Elevating Work Platforms and Aerial Devices
- Attachment 1: Platform and Aerial Lift Inspection
- Attachment 2: Ladder Inspection Form
- Attachment 3: Fall Protection Inspection Form

PURPOSE

The purpose of this program is to ensure that all work at heights is performed safely at Santa Clara University.

APPLICABILITY

This program covers the minimum requirements for Santa Clara University employees for the inspection, care and use of the following:

- Ladders: portable, fixed, stepladders, stands, scaffolding, job-made ladders, etc.
- Aerial Lift Inspections
- Fall protection equipment: harnesses, lanyards, carabineers, etc.

It is not the purpose of this program to specify the details of construction for all ladders, lifts, etc.

DEFINITIONS

Anchorage: A secure point of attachment for personal fall arrest equipment (e.g., lifelines, lanyards, or deceleration devices).

Angle of Inclination: The preferred pitch of portable non-self-supporting ladders.

American National Standards Institute (ANSI) Duty-Rating Sticker: ANSI requires that a duty-rating sticker be placed on the side of the ladder. When selecting a ladder, be sure to use the proper duty rating to carry the combined weight of the user and material. The ladder duty ratings are as follows:

- Type 1A (Extra Heavy Duty Industrial): 3-20 feet for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 300 pounds.
- Type I (Industrial): 3-20 feet for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 250 pounds.
- Type II (Commercial): 3-12 feet for medium duty, such as painters, offices, and light industrial use. Load capacity not to exceed 225 pounds.
- Type III (Household): 3-6 feet for light duty, such as light household use. Load capacity not to exceed 200 pounds.

Aerial Lift: Any vehicle mounted on self-propelled device, telescoping extensible or articulating, or both, which is primarily designed to position personnel.

Back Leg (rear rail): The support members of a self-supporting portable ladder back section. The back legs are joined by rungs, bars, rear braces or other bracing to form the back section.

Body Harness: A component comprised of chest and shoulder straps with means for fastening it about the torso and for attaching it to other components so that the fall arrest forces are distributed over at least the upper thighs, pelvis, chest and shoulders.

Cage: An enclosure that is fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder. Also referred to as a cage or basket guard.

Cleats: Ladder crosspieces of a rectangular cross-section placed on edge on which a person may step in while ascending or descending.

Combination Ladder: A portable ladder capable of being used either as a stepladder or as a single or extension ladder.

Double Front Ladder: A self-supporting ladder, non-adjustable in length, consisting of two (2) sections intended for climbing on both sides.

Extension Ladder: A non-self-supporting portable ladder adjustable in length. It consists of two (2) or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the same of the lengths of the sections measured along the side rails.

Fall Protection: A system that provides fall protection at all times, so that there is no time during which an individual performing elevated work is even temporarily exposed to a fall.

Fastenings: A device to attach a ladder to a structure, building or equipment.

Fixed ladders: Ladders that are permanently placed in a specific location and not portable.

Grab Bars: Individual handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder.

Job-Made Ladders: Ladders that have been constructed for temporary use during a construction or renovation project.

Ladder: An appliance usually consisting of two (2) side rails joined at regular intervals by crosspieces called steps, rungs or cleats, on which a person may step while ascending or descending.

Lanyard: A flexible line to secure the wearer of a body harness to a lifeline, or fixed anchorage. Lanyards may include self-retracting devices or a shock-absorbing (decelerating) device.

Maximum Extended Length or Maximum Working Length: The total length of the extension ladder when the middle or intermediate and top or fly sections are fully extended (maintaining the required overlap).

Personal Fall Arrest System (PFAS): A system used to arrest a worker in a fall from a working level. It consists of an anchor point, connectors, body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. NOTE: As of January 1, 1998, OSHA has prohibited the use of body belts as part of PFAS.

Reinforced Plastic Ladder: A device whose side rails are constructed of reinforced plastics. The crosspieces may be constructed of metal, reinforced plastics or other suitable materials. This term does not denote the absence of all metallic elements because even in ladders with side rails and crosspieces manufactured of reinforced plastics, the hardware and fasteners may be metallic.

Rungs: ladder crosspieces of circular or oval cross-section on which a person may step while ascending or descending.

Single Ladder: A non-self-supporting portable ladder, nonadjustable in length, consisting of but one (1) section. The overall length of the side rail designates its size.

Stepladders: A self-supporting portable ladder, nonadjustable in length (include industrial stepladders, 3 to 20 feet for heavy duty use; commercial stepladders, 3 to 12 feet for medium duty such as painting; and household stepladders, 3 to 6 feet for light duty, having flat steps and a hinged back. Its size is designed by the overall length of the ladder measured along the front edge of the side rails.

Steps: The flat crosspieces of a ladder on which a person may step while ascending or descending.

Step Stool (ladder type): A self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in overall size, with flat steps and without a pail shelf, designed so that the ladder top cap as well as all steps can be climbed on. The side rails may continue above the top cap.

Working Load: The maximum applied load, including the weight of the user, materials and tools, which the ladder or lift can support for the intended use.

DESIGN REQUIREMENTS

Ladder Requirements

- All ladders must be maintained in a safe condition and must be inspected prior to each use.
- All portable ladders belonging to Santa Clara University must be labeled clearly and permanently with "Santa Clara University or with an EQ (equipment) number.
- The distance between rungs, cleats and steps must not exceed 12 inches and must be uniform throughout the length of the ladder.
- Rungs and steps must be corrugated, knurled, dimpled coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.
- The minimum width between side rails of a straight ladder or any section of an extension ladder must be 12-inches.
- The length of single ladders or individual sections of portable extension ladders must not exceed 30-feet. Two-section ladders must not exceed 48-feet in length and over two-section ladders must not exceed 30-feet. Two-section ladders must not exceed 48-feet in length and over twosection ladders must not exceed 60-feet in length.
- Based on the nominal length of the ladder, each section of a multi-section portable extension ladder must overlap the adjacent section by at least the number of feet stated in the following:

Type, Size of Ladder (feet)	Overlap (feet)
Two section ladder, 33 feet	3
Two section ladder, 33-44	4
Three section ladder	4

• Extension ladders must be equipped with positive stops that will ensure the overlap specified in the table above.

Portable Metal Ladders

- Metal ladders must be labeled with a DANGER warning sticker indicating electrocution hazard and shall not to be used when there is a potential electrocution hazard.
- Metal ladders and appurtenances must be painted or otherwise treated to resist corrosion and rusting when location demands.
- Metal ladders must not be exposed to heat as they can lose their tensile strength.

Step Ladders

- Stepladders must not exceed 20-feet in length. (The length of a stepladder is measured by the length of the front rail. To be classified as a standard length ladder, the measured length must be within plus or minus one-half (1/2) inch of the specified length.).
- The bottoms of the tour (4) rails are to be supplied with insulating non-slip material for the safety of the user.
- A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position must be a component of each stepladder. The spreader must have all sharp points or edges covered or removed to protect the user.

Potable Wooden Ladders

Portable wooden ladders are not permitted at Santa Clara University.

Fixed Ladders

- The minimum design live load must be a single concentrated load of 200 pounds.
- The number and position of additional concentrated live load units of 200 pounds each as determined from anticipated usage of the ladder must be considered in the design.
- The live loads imposed by persons occupying the ladder must be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.
- The weight of the ladder and attached appurtenances together with the live load must be considered in the design of rails and fastenings.
- All rungs must have a minimum diameter of three-fourths (3/4) inch for metal ladders and 1.24 inch for wood ladders.
- The rungs of an individual-rung ladder must be so designed that the foot cannot slide off the end.
- Fastenings must be an integral part of fixed ladders design.
- All splices made by whatever means must meet design requirements as noted in 8 CCR 3277(d)(8). All splices and connections must have smooth transition with original members and with no sharp or extensive projections. No welding must be allowed on any metal ladders.
- The preferred pitch of fixed ladders must be considered to come in the range of 75° and 90° with the horizontal.
- Fixed ladders must be considered as substandard if they are installed within the substandard pitch range of 60° and 75° with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range must be considered as a critical range to be avoided, if possible.

A safety cage shall be provided (unless other ladder safety device) on fixed ladders of more than 20 feet to a maximum unbroken length of 30 feet. Cages shall extend a minimum of 42 inches above the top of landing, unless other acceptable protection is provided. Cages shall extend down the ladder to a point not less than 7 feet or more than 8 feet above the base of the ladder, with the bottom of the cage flared out at least 4 inches.

Portable Reinforced Plastic and Fiberglass Ladders

 The ladder must have sufficient strength and stiffness to meet the performance requirements of ANSI Standard A14.5-2007, and must produce a ladder without structural defects and accident hazards such as sharp edges, burrs, and the like.

FALL PROTECTION PROCEDURES

Elevated Work Platforms and Aerial Lifts

- 1. Elevated work platforms and aerial lifts must be inspected prior to operation. The inspection must verify:
 - The elevating platform is in safe operating condition. Units will be visually inspected by a qualified operator for damaged or defective parts before use utilizing the appropriate section of the Elevated Platform and Aerial Lift Inspection Checklist (Attachment 1).
 - The operating instructions are available or otherwise readily accessible to operators for reference.
 - The surface of the elevated platform is free from clutter.
 - The platform is not loaded in excess of the design working load of the equipment.
 - Ladders or other objects are not placed on the top of elevated platforms to gain access to greater heights.

2. Required Safety Equipment

- A full body harness must be worn and a lanyard attached to a secure structure (capable
 of supporting at least 5,000 pounds per person) above the person if one or both feet leave
 the floor of the lift. When a body harness is used in a fall arrest system, the lanyard shall
 be rigged with a deceleration device to limit maximum arresting force to 1,800 pounds
 and prevent the person from hitting any levels or objects below the platform, and shall
 limit free fall to a maximum of 6 feet.
- Harnesses will be secured to a separate secure structure and not directly to the lift unless recommended by the manufacturer (see also additional requirements below for aerial lifts)

3. Elevated Platform Operations

- Employees will not perform outside work on elevated work platforms when exposed to high winds (greater than 10 miles per hour) or electrical storms (within 10 miles of location). Employees (or they can request their supervisor to check) will check the weather report at www.weather.com.
- When moving or raising an elevated platform, the operator must use caution and check for overhead obstructions and electrical hazards.
- Precautions will be taken to prevent the likelihood of materials falling from elevated work surfaces:
 - o The platform will be maintained free of clutter during operations.
 - o Traffic will be controlled in the area surrounding elevated work.
 - O Unstable materials (boxes, tools, debris, etc.) will not be stored on the elevated work platform.
 - o The lift will not be used as a material hoist or personnel elevator.
 - o Oxygen and fuel cylinders will not be stored on a scissor lift. When welding and cutting is done, the cylinders shall remain on the floor in a secured position.
- 4. Specific Requirements for Scissor Lift:
 - The travel speed at maximum travel height will not exceed 3 feet per second.
 - ONLY qualified operators will be granted authority for independent operation of scissor lift equipment. Qualified operators are defined as those who have been trained on the specific lift equipment.

5. Specific Requirements for Aerial Bucket Lifts

- A full body harness must be worn and a lanyard rigged with a deceleration device shall be
 attached to the equipment anchorage point in the bucket at all times. Belting off to an
 adjacent pole, structure, or equipment while working from an aerial lift shall not be
 permitted.
- An operator must be in control of the bucket lift from inside the bucket. A bucket lift may not be operated from the floor level by another person, except in emergency situations.
- When moving or raising a bucket lift, the operator must use caution and check for overhead obstructions and electrical hazards.
- The travel speed at maximum travel height will not exceed 3 feet per second.
- ONLY trained and certified operators will be granted authority for independent operation of aerial bucket lifts.

- 6. Specific Requirements for Lift Truck Operated Work Platforms:
 - Work platforms used to elevate personnel must be at least 24" by 24", be secured to
 the lift truck to prevent tipping, slipping or falling, be equipped with guardrails and
 toe boards, and the platform floor shall have a slip resistant surface with no holes or
 spaces greater than 1 inch.
 - All lift trucks using an elevated platform to lift personnel must be rated for that purpose.
 If the owner's manual is silent on such use, the Responsible Supervisor must either find
 out from the manufacturer that it was designed for this use or (where that information is
 unavailable) obtain a certification by a certified professional engineer that the equipment
 was so designed.
 - Only lift trucks with smoothly operating lifting mechanisms shall be used.
 - The lift truck mast will not be tilted forward or rearward while employees are elevated.
 - The lift truck being used must be placed in neutral and the parking brake must be set while elevating employees.
 - An operator must be in the control position on the lift truck while employees are in the elevated platform.
 - Lift truck operators and elevated employees must continue to watch for overhead obstructions.
 - The operator must keep hands and feet clear of controls other than those in use.
 - NEVER travel with employees on the work platform other than to make minor movements for final positioning of the platform.
 - ONLY employees that have received training on the safe use of elevated platforms will be allowed to perform work while being elevated with a lift truck.

ONLY employees that have received training on how to properly elevate employees in work platforms with a lift truck will be allowed to perform this task.

Ladders

- Only properly maintained ladders shall be used at Santa Clara Mission Cemetery. Units will be visually inspected before use for damaged or defective parts to include the following:
 - All hardware and fittings will be securely attached.
 - All movable parts operate freely without undue binding or play.
 - Safety feet are in good condition.

Rungs are kept free from grease and oil.

2. Ladder Use Requirements:

- Maintain three-point contact (two hands and one foot, or two feet and one hand). This
 effectively eliminates the use of most tools while on the ladder.
- Face the ladder and not carry anything when ascending and descending.
- Use both hands when climbing up or down the ladder.
- Ascend and descend ladders, one person at a time. No two employees will occupy a ladder at the same time, unless it is specifically engineered for this purpose.
- Ladders will not be placed in front of door openings, opening toward the ladder unless the door is locked shut.
- Ladders will not be placed on unstable surfaces (boxes, barrels, pipes).
- Ladders used to gain access to a roof may not be used unless the top of the ladder extends 3 feet above the surface of the roof and it is secured at the top using a rope or other locking device.
- When access to platforms is by fixed vertical ladders, inward-opening gates should be fitted to prevent falls from the platform.
- Ladders and steps used for maintenance should be stored securely (e.g., under lock and key, secured to the vehicle, etc.) to prevent general use.

3. Periodic Inspections:

 Annual ladder inspections are recorded using the Ladder Inspection Checklist (See Attachment 2).

Roofs

Before starting work on roofs or fragile surfaces, employees should always question if work on or near the edge of roofs or fragile surfaces are really necessary or can alternatives be found. If absolutely necessary, such work shall be planned, organized, adequately supervised and approved by SCU EHS.

The following locations at SCU have administrative or physical fall protection systems installed:

- 1. Alameda Hall Skylight Protection and Railing
- 2. Book Store Skylight Protection Railing System
- 3. Benson Center Skylight Protection and Multiple Fall Anchor Points
- 4. Charney Hall Multiple Fall Anchor Points with a Trolley System

- 5. Cowell Health Center Multiple Anchor Points and Railing System
- 6. Daly Science 100, 200 and 300 Multiple Fall Anchor Points
- 7. De Saisset Museum Fall Protection Anchor Hook and Line along with Railing System
- 8. Finn Hall Cable system along with Anchor Points
- 9. DOWD AAH Fall Protection "Trolley" System
- 10. Guadalupe Hall "Do Not Cross" Line
- 11. Kenna Hall Multiple Fall Anchor Points and Railing
- 12. Leavey Events Center "Do Not Cross" Line
- 13. Lucas Hall Anchor Points
- Pat Malley Center Railing System and multiple fall anchor points with a trolley system
- 15. Shapell Lounge Skylight Protection Railing System
- 16. St. Clare Commons Railing System
- 17. Substation Fall Protection "Trolley" System
- 18. University Operations Multiple Fall Anchor Points
- 19. Vari Hall Anchor Point
- 20. Walsh/McLaughlin Residence Hall Anchor Point

Scaffolds

SCU Facilities Personal are not qualified to erect or work on any scaffolds.

Fall Protection Equipment

Fall protection equipment is only provided to employees who have been sufficiently trained to competently perform their duties. Fall protection equipment will not be provided to non-employees (temporary employees are considered employees for this purpose).

Fall protection equipment will be utilized when a hazard of a fall from an elevated area exists. The following are examples of conditions or situations where fall protection is required:

- Working at heights of six (6) feet or greater where no fall protection is in place such as handrails, mid-rails, floor coverings and/or walls.
- On any sloped roof where catch platforms or guard railing is not provided.
- Where erecting steel or temporary scaffolding.
- Leaving the confines of a lift or ladder that is six (6) feet or higher from the lower level.
- Working within six (6) feet of flat roof edges without handrails.
- 1. Inspection prior to use
 - All safety harnesses, retractable lifelines, lanyards, deceleration devices and accessories will
 be visually inspected before each use by the user to determine the condition of the fall
 protection equipment. Fall protection devices that fail this visual inspection will be immediately

removed from service and returned to the Responsible Supervisor. All fall protection equipment not repairable will be destroyed immediately.

- Harnesses, lanyards, lifelines and accessories will be visually inspected for defects in the following manner:
 - Examine webbing for cuts, cracks, tears, enlarged eye holes, or other warning signs of wear that might affect strength.
 - Examine stitching for breaks, ragged strands, loose or rotted threads and other signs of weakening.
 - Examine metal hardware for breaks, cracks, pits, fractures, loose anchorage or other signs of wear or deterioration that might affect the strength of the equipment or its fastening devices.
 - Examine lifelines and lanyards for frayed or broken strands, cuts and abrasions.
 Inner fibers should be examined for breaks, discoloration and deterioration.
 Particular attention should be given to snaps and splices connecting the lanyard to the thimble.
 - Along with the visual inspections, users must ensure retractable lifelines are functioning properly by checking that the lifeline fully retracts into housing and that the braking mechanism is functioning properly. The user must also verify the load impact indicator (when equipped) is not showing.

2. Periodic Inspection Requirements:

- Personal fall protective equipment must be inspected by a competent person other than the user at intervals of no more than six months.
 - Competent person inspections shall be documented using the appropriate section
 of the Fall Protection Inspection Checklist (See <u>Attachment 3</u>). Periodic inspections
 shall also be recorded on the equipment inspection label when available.
 - Some manufacturers require retractable lifelines be periodically returned for recertification. If this is required, the housing will be marked to indicate when and how often the recertification is required.

3. Use Requirements:

• Personal protection equipment (harnesses, lanyards, etc.) along with connectors and other related items shall be stored in a clean, dry environment free from direct sunlight, dust,

- excessive heat and harmful chemicals. A stock of full body harnesses and lanyards will be available for distribution to trained employees.
- Strength requirements for all devices will be strictly adhered to. Retractable lifelines, static
 lines or lanyards must be rated for a minimum of 5000 lbs. Anchor points must be capable of
 supporting 5000 lbs. per employee. Self-retracting lifelines and lanyards which automatically
 limit free fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of
 3,000 pounds.
- Fire protection piping, chemical lines, instrument tubing and electrical conduits are not to be used as anchorage points for fall protection.
- Lanyards will have a shock absorbing feature and lock snapping device and must limit a fall to six feet with a maximum arresting force of 1,800 pounds.
- Lanyards will be attached to an anchor point such that a person can neither free fall more than 6 feet, nor contact any lower level, and, where practicable, the anchor end of the lanyard shall be secured at a level not lower than waist level.
- Lanyards shall be attached to the body harness in the center of the wearer's back near shoulder level, or above the wearer's head.
- For Hot Work operations or those operations that utilize acids or solvents, the lanyard will be kept free of the exposure or the use of a steel cable lanyard must be incorporated.
- Knots will not be tied into lanyards as this reduces the tensile strength beyond 50%.
- The snap hook will not be hooked into the flange of an I-beam. This affords little or no fall
 protection. Use a beam clamp or tie-off anchor specifically designed and rated for this
 application.
- Full body harnesses will be the only acceptable personal protection to arrest a fall. SAFETY BELTS WILL NOT BE UTILIZED FOR ANY PURPOSE OTHER THAN FOR BODY POSITIONING.
- Any lanyard, safety harness, lifeline or other component subjected to in-service loading, shall be immediately removed from service.
- Snap hooks and carabineers used with fall protection equipment must be self-closing and self-locking, and must require two deliberate actions to open.
- Personnel lifts and scaffolds will be utilized in addition to safety harnesses alone, where feasible.

REPORTING

The EHS will review the written program, equipment inventory, permits, employee training, and specific operating procedures, to the degree necessary to assure program compliance every three years or sooner.

TRAINING AND AWARENESS

- All employees required to take part in elevated work receive training in fall protection prior to being assigned elevated work activities. Initial training consists of the following topics:
 - o The contents of this procedure,
 - o Practical application,
 - o Permit process for "Fall Protection", and
 - o Safe use of fall protection equipment.
- Only competent employees will be authorized to inspect scaffolding which is defined as:
 - Must have been trained to understand the requirements of OSHA's scaffold standards (8 CCR 1637, 1640-1655, 1658-1667);
 - o Have the authority to take prompt measures to correct defects and eliminate hazards.
- Only competent employees will be authorized to perform competent person inspections of the personal fall protection equipment.
- Employees performing elevated work on a continued basis receive periodic refresher training.

 Refresher training consists of the same topics as the initial training and occurs at least annually.

ROLES AND RESPONSIBILITIES

Fall Protection roles and responsibilities for Santa Clara University employees are identified as follows:

EHS

- Complete semi- annual fall protection inspections (e.g. Fall Harness and Limiter).
- Coordinate annual fall protection system inspections.
- Review new construction plans for fall protection needs.
- Review existing SCU Buildings for any fall protection needs.
- Review SCU Fall Protection Program every three years or as needed.

Facilities Employees

- Complete aerial lift inspection prior to use and provide to EHS Staff.
- Notify EHS Staff when a ladder is taken out of service.
- Perform inspections on equipment prior to working at height.
- Use fall protection equipment and follow all SCU Fall Protection Procedures.

Facilities Supervisors

- · Conduct annual ladder inspections and provide a copy to EHS Staff
- Destroy ladders that "fail" annual ladder inspection and cannot be repaired.
- Ensure all Facilities Employees follow the SCU Fall Protection Procedures.

Faculty and Staff

- Conduct annual ladder inspections and provide a copy to EHS Staff
- Destroy ladders that "fail" annual ladder inspection and cannot be repaired.
- Ensure all Employees follow the SCU Fall Protection Procedures.

PROGRAM REVIEW RECORD

Name	Title	Department
Dave Mathe	Manager	SCU Environment, Health & Safety

REVISION HISTORY

Number	Date	Summary of Changes
4	10/08/2019	Update fall protection equipment
3	09/03/2019	Add Cowell, Finn, Lucas and Vari Hall
2	02/28/2019	Update fall protection systems
1	06/20/2016	Update Ladder Permit
New	05/19/2010	New

PROGRAM APPROVAL RECORD

Signature of file in the EHS Office		
Signature	Date:	
Sean P. Collins	10/08/2019	
Director - Environment, Health and Safety		