



1800 SCAFFOLD SAFETY PROGRAM

Document History

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Purpose

The purpose of this program is to provide scaffold safety procedures to prevent injury to employees while working on, or in the vicinity of, scaffolds. This includes, but is not limited to, mobile scaffolds, suspension scaffolds, and all supported scaffolds. In addition, information is provided to provide guidance on training required as well as how to respond to an emergency.

Scope

This program applies to all University of Virginia employees and establishes safety requirements for the proper construction, inspection, maintenance, operation, and use of scaffolds.

Definitions

“Aerial lift” means a mobile device used to elevate workers to job sites above the ground. It includes extension boom platforms, aerial ladders, articulating boom platforms, scissors lift platforms, vertical towers, or any combination of these.

“Bearer” means a horizontal transverse scaffold member upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

“Body harness” means a design of straps which may be secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system.

“Competent person” means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

“Fabricated decking and planking” means manufactured platforms made of wood, metal, and other materials.

“Fabricated frame scaffold (tubular welded frame scaffold)” means a scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

“Guardrail system” means a vertical barrier consisting of toprails, midrails, and posts, erected to prevent employees from falling off of a scaffold platform or walkway to lower levels.

“Leading edge” means the edge of a floor, roof, formwork, decking, or other walking/working surface which changes location as additional floor, roof, formwork, or decking is constructed.

“Mobile scaffold” means a powered or un-powered portable, caster, or wheel mounted supported scaffold.

“Personal fall arrest system” means a system used to arrest an employee’s fall that consists of an anchorage, connectors, body harness, and may include a lanyard, deceleration device, lifeline, or combination of these.

“Platform” means a work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

“Qualified person” means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated ability to solve or resolve problems related to the subject matter, the work, or the project.

“Supported scaffold” means a platform supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

“Suspension scaffold” means a platform suspended by ropes or other non-rigid means from an overhead structure.

Responsibilities

UVA Facilities Management

It is the responsibility of the UVA Facilities Management to implement this Scaffold Safety Program. Continual observational safety checks of work operations and rigid enforcement of safety policies and procedures shall be ongoing. All jobs should be pre-planned prior to the start of work.

Competent Person

Competent Persons shall operate and be trained in accordance with Occupational Health and Safety (OSHA) standards (see *Governmental Standards*). The Competent Person will be responsible for:

- Directing employees who erect, dismantle, move, or alter scaffolding;
- Determining if it is safe for employees to work from a scaffold during adverse weather;
- Training employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolding to recognize work associated hazards;
- Inspecting scaffold and scaffold components for visible defects before each work shift and after every occurrence which could affect the structural integrity of a scaffold system;
- For suspension scaffolds, evaluating direct connections to support the load to be imposed;
- For erectors and dismantlers, determining the feasibility and safety of providing fall protection and access; and
 - Determining if a scaffold will be structurally sound when using scaffold components from different manufacturers; and
 - Determining if galvanic action has occurred that will compromise the integrity of scaffold components when using components of dissimilar metals.

Qualified Person

Qualified persons shall be responsible for:

- Designing and loading scaffolds in accordance with design specifications;
- Training employees working on scaffolds to recognize associated hazards and understand procedures to control or minimize hazards; and
- For suspension scaffolds:
 - Making attachments and other modifications to wire suspension ropes; and
 - Designing components in accordance with design specifications.

Procedure

University departments or zones that require employees to use scaffolds must designate a “competent person” to oversee erecting, securing, and dismantling of scaffolds. The competent person must understand policies and procedures related to scaffold systems under his or her purview and be able to conduct scaffold inspections and manage daily activities involving scaffold use. In addition, the competent person must be familiar with the University’s *Fall Protection Program* and any personal protective equipment (PPE) that may be required.

In the event of a scaffold that is more than three stories (bucks) high, UVA Facilities Management Occupational Health and Safety must be notified in addition to a Qualified Person who is able to design a scaffold system to proper engineering and manufacturer’s specifications.

UVA Facilities Maintenance has a 100% fall protection policy that requires that all operations utilizing any type of scaffold system implement fall protection that includes guardrails, personal fall arrest systems, or any combination of fall protection applicable to the job at hand pursuant to FM's *Fall Protection Program*.

Governmental Standards

Applicable standards for the use of scaffolds fall under both General Industry and Construction, though the bulk of activities that apply to scaffold use will fall under Construction. Specific applicable OSHA standards:

- 29 CFR 1926, Subpart L, *Scaffolds*
- 29 CFR 1910.28, *Safety requirements for scaffolds*
- ANSI/ASSE A10.8-2011, *Scaffolding Safety Requirements*

Standards

The following are minimum standards for University of Virginia – Facilities Management employees when erecting, moving, working on or around, and dismantling scaffolds.

General Requirements for Scaffolding

- The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, loose brick, concrete, or concrete blocks shall not be used to support scaffolds or planks.
- Any scaffold damaged or weakened from any cause shall be immediately repaired by a competent person or party and shall not be used until repairs have been completed, and verified by a Qualified Person.
- Scaffolds shall not be loaded in excess of their working load.
- The poles, legs, or uprights of scaffolds shall be plumb and securely braced to prevent swaying and displacement.
- Materials being hoisted onto a scaffold shall have a tag line.
- Employees shall not work on scaffolds during storms or high winds.
- The use of shore scaffolds and lean-to scaffolds are prohibited.
- Scaffolds shall be secured to permanent structures through the use of anchor bolts or other equivalent means. Window cleaners' anchor bolts shall not be used.
- Special precautions shall be undertaken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.
- Operations that require a scaffold over 30 feet in height should notify the UVA Facilities Management Occupational Health and Safety Office in advance of the start of work to determine whether a qualified person is required to determine safe design and loading characteristics of the scaffold system.
- Ensure proper clearance when using in proximity to overhead power lines as scaffolds can put employees at risk of electrocution.
- Ensure that shore or lean-to scaffolds are not used in any worksite as these types of scaffolds are prohibited.
- Ladders shall not be used on scaffolds to increase the working level height of employees.

Platform Construction

- All scaffold platforms except walkways and platforms used by erectors and dismantlers, must be fully decked or planked between the front uprights and the guardrail supports. The opening between the uprights and the planking cannot exceed one inch unless it can be demonstrated that a wider opening is necessary.
- In those instances where it is infeasible to maintain a 1 inch space between units and the scaffold uprights, the platform shall be planked as fully as possible and the open space between the platform and the uprights shall not exceed 9.5 inches. This is not a common situation.
- Each platform walkway shall be at least 18 inches wide. In the event that it is infeasible to create a walkway at least 18 inches wide, then the walkway should be as wide as possible and the employee shall be protected by appropriate fall protection to include guardrails and/or a personal fall arrest system.
- The front edge of the platform must not be more than 14 inches from the face of the work in order to prevent falls between the scaffold and the work face. If more space is needed, the appropriate fall protection is required to include guardrails and/or a personal fall arrest system. Consult the UVA Facilities Management Occupational Health and Safety Office if fall protection would inhibit work on platforms greater than 14 inches from the work face.

Overlap and Cleats

- The preferred method of planking a scaffold is use a plank with a cleat at each end and place it securely over a bearer in order to hold it in place securely and prevent movement.
- In the absence of a cleated plank, platforms must overlap their support by at least 6 inches.
- Unless it is designed and installed to support employees and materials without tipping, or has guardrails that block employee access, each end of a platform may not extend over its support more than 12 inches (for platforms 10 feet or shorter in length) or more than 18 inches (for platforms more than 10 feet long).
- On scaffolds where platforms are overlapped to create a long platform, the overlap may only occur over supports and may not be less than 12 inches unless the platforms are restrained (nailed together, for example) to prevent movement.
- On scaffolds where platforms are abutted to create a long platform, each abutted end must rest on a separate support surface.
- When platforms must overlap because a scaffold changes direction, such as turning a corner, platforms that rest on a bearer at an angle other than a right angle shall be laid first, and platforms that rest at right angles over the same bearer shall be laid second, on top of the first platform.
- Wood platforms cannot be covered with opaque finishes because opaque finishes cover defects in wood. Wood platform edges, however, may be marked for identification.
- Work on platforms cluttered with debris is prohibited.

Brackets

When brackets are used to support cantilevered platforms, they must:

- Be seated with side-brackets parallel to the frames and end-brackets at 90 degrees.
- Be used to support personnel, unless the scaffold has been designed for other loads by a qualified engineer and built to withstand the tipping forces caused by other loads.

Capacity

- Each scaffold and scaffold component must support without failure its own weight and at least four times the maximum intended load applied or transmitted to it. The intended load includes workers, equipment, and supplies. The intended load should never exceed the rated load unless the design is approved by an engineer and the manufacturer.

- A qualified person must design, and obtain FM-OHS approval for scaffolds three stories or higher to ensure that the scaffold system can meet the load requirements.
- Scaffolds and scaffold component parts should never be loaded beyond their maximum capacity and must meet the 4:1 safety factor for that portion of the maximum load applied to them. The maximum intended load for a component depends on the scaffold type and its configuration. A scaffold can be overloaded by:
 - Too many people being on the platform.
 - Too much material being stored on the platform.
 - Point loading, or concentrating too much of the load in one area.

Access to Scaffolds

Safe access to scaffolds and scaffold platforms is critical as workers are most vulnerable when climbing on or off a scaffold. Erectors and dismantlers face additional challenges due to the incomplete condition of the scaffolding.

General

- Scaffold platforms that are 2 feet or more above or below an adjacent level must have a way to safely access that level. This can include portable ladders, hook-on ladders, attachable ladders, and stairway-type ladders.
- In no instance should a crossbrace be used to access a scaffold.

Ladders

In the event that hook-on, portable, or stairway-type ladders are the chosen method of access, they must:

- Be specifically designed for use with the type of scaffold on which they are used.
- Be positioned so as to not tip the scaffold.
- Have uniform spacing between the rungs of at least 11.5 inches not to exceed 16.75 inches.
- Have rest platforms for stairway-type ladders located no more than 35 vertical feet.
- Have steps of stairway-type ladders and rungs of vertical ladders that line up vertically with each other between rest platforms.

Ramps and Walkways

- No ramp or walkway shall incline more than 1:3 (1 vertical to horizontal, or 20 degrees above the horizontal).
- If a ramp or walkway has a slope of more than 1:8, it must have cleats securely fastened to the planks not more than 14 inches apart, to provide footing.

Stair Towers

Stair towers provide the safest means of access to scaffold platforms as the stairway is built into the platform. Stair towers must:

- Have a toprail and midrail located on each side of the stairway.
- The toprail must be capable of also serving as a handrail, unless a separate handrail is provided, with a space of at least 3 inches between other objects.
- The ends of the stairrail systems and handrails must be so constructed to avoid causing injuries to employees and snagging of clothing.

- Have slip-resistant surfaces on treads and landings.
- Provide uniform tread depth for each flight of stairs.
- Have a landing platform at least 18 inches wide and 18 inches long at each level.
- Have a scaffold stairway width of at least 18 inches between stair rails.

Special Considerations for Employees Erecting or Dismantling Scaffolds

Workers who erect and dismantle supported scaffolds must, if feasible, use fall protection.

- A competent person must make the feasibility determination at each stage of the erecting and dismantling process based upon site conditions and the type of scaffold.
- Hook-on or attached ladders should be installed as soon as possible once scaffold erection progress allows for them.
- Do not use cross braces as a means of access or egress.

Protecting Workers from Falling Objects

Injuries that are the result of being struck by an object or piece of equipment that has fallen from a scaffold are possible if steps are not taken to reduce worker exposure to falling objects. Employees that are working on scaffolds, as well as the employees that are working at lower levels underneath scaffolds, must be afforded protection from falling objects according to the hazards present.

It is important to determine what types of material may be carried onto, used, and/or temporarily stored on a platform and consider the use of the following where there is a danger of items falling to a lower level and striking employees below:

- Install toeboards, screens, or guardrail systems to mitigate the hazard of items being accidentally knocked off of a scaffold platform.
- If materials are piled higher than the toeboard where persons are required to work or pass under the scaffolds, install debris nets, catch platforms, or canopy structures that contain or deflect falling objects.
- Place potential falling objects away from the edge of the platform surface when they are too large, heavy, or massive to be contained by any of the above measures and secure them as necessary to prevent falling to a lower level.
- When possible, the area below the scaffold should be barricaded so that employees are not able to enter the hazard area.
- Toeboards shall be erected along the edge of platforms more than 10 feet above lower levels and if material is piled to a height higher than the top edge of the toeboard, then steps should be taken to mitigate material falling over the toeboard such as paneling of screening that extends from the top of the toeboard to the top of the guardrail.
- Toeboards should be solid and should be securely fastened in place at the outermost edge of the platform, be at least 3.5 inches high from the walking/working surface, and be able to withstand a 50 pound force applied in any downward or horizontal direction at any point
- Any canopy structure debris net, or catch platform should be strong enough to withstand the impact forces of the potential falling material. Think about what may fall and ensure the protection is adequate.

Protecting Workers from Falling

All employees of UVA shall observe 100% fall protection when operating on a scaffold in order to prevent a fall to a lower level. This 100% protection helps to ensure the health and safety of workers and takes the guesswork out of when to use fall protection.

Fall protection consists of either a personal fall arrest system or guardrail systems meeting OSHA requirements. Guardrail systems are the preferred method of fall protection at UVA. Employees performing overhand bricklaying operations from a supported scaffold must be protected from falling from all open sides and ends of the scaffold, except at the side next to the wall being laid.

Personal Fall Arrest Systems

Refer to the UVA *Fall Protection Plan* for complete guidance on personal fall arrest systems.

- A personal fall arrest system consists of an anchor, body harness, and connection from the body harness to an anchor via a lanyard or self-retracting lifeline.
- Personal fall arrest systems used on scaffolds are to be attached by a lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.
- When vertical lifelines are used, they must be fastened to a suitable anchor capable of withstanding 5,000 pounds of force or a safety factor of two. Consult UVA FM-OHS for assistance in determining appropriate anchor points.
- When horizontal lifelines are used, they are to be secured to two or more structural members of the scaffold.

Guardrail Systems

- Guardrails systems must be installed along all open sides and ends of platforms, and must be in place before the scaffold is released for use by employees other than erection/dismantling crews.
- Full specifications for guardrails that meet the requirements of OSHA and UVA FM-OHS can be found in the UVA *Fall Protection Plan*.

Scaffold Types

There are many different types of scaffolds. It is important that the correct scaffold is used for the job at hand. The use of an incorrect system is a life safety hazard and is to be avoided. Should employees need assistance with scaffold selection, contact UVA Facilities Management Occupational Health and Safety for assistance. Any scaffold over three stories (bucks) high is to be designed by a qualified person. In addition, enlisting the assistance of a qualified person should be considered in those circumstances that require scaffold design that is outside of the normal parameters of scaffold construction. Example circumstances include placing scaffolds on uneven ground, near buildings with hard to navigate or sensitive architectural features, or scaffold systems that may be near the general public.

Supported Scaffolds

A supported scaffold is one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support. The most common type of supported scaffold in use at UVA is a fabricated frame scaffold because they are versatile, economical, and easy to use. They are frequently used in one or two tiers, but their modular frames can also be stacked several stories high.

Once a scaffold is built, even if it is compliant with required standards related to footings, structure, and capacity, it will not provide a safe work platform if it does not stay upright. As a general rule, a scaffold becomes unstable once its height is four times its minimum base dimension, even if it is plumb and square. Extreme weather or damage to structural components can also affect a scaffold's stability. A list of the most common supported scaffold types is indicated in *Appendix A* of this document, along with requisite safety and construction considerations for each type.

Height to Smallest Base Dimension

- Supported scaffolds with a height to smallest base width ratio of more than four to one (including outrigger supports) must be restrained from tipping by ties, guys, braces, or equivalent means. “Equivalent means” refers to other designs, materials, or methods that provide an equal or greater degree of safety for workers.

Guys, Ties, and Braces

- Guys, ties, and braces must be installed where horizontal members support both inner and outer legs and must be installed according to the manufacturer’s recommendations or at the closest horizontal member to the four to one height and repeated vertically at least every twenty feet if the scaffold is up to three feet wide and every 26 feet if the scaffold is greater than 3 feet wide.
- Vertical tie-ins designed by a qualified person should be used to keep a scaffold from falling into or away from a structure.

Support Surface

- Poles, legs, posts, frames, and uprights must bear on base plates and mudsills or a firm foundation.
- Base plates are always required on supported scaffolds. A concreted slab is considered a firm foundation and can be substituted for mudsills.
- The scaffold must be plumb and square to avoid swaying.

Bracing

- Frames and panels must be connected by cross, horizontal, or diagonal braces, alone or in combination, which secure vertical members together laterally.
- As frames are stacked, cross braces must be of such length as will automatically keep the scaffold plumb, level, and square.
- All brace connections must be secured to prevent dislodging.

Pinning

- Frames and panels must be joined together vertically by coupling or stacking pins or equivalent means.
- Frames and panels must be locked together to prevent uplift, which is the separation of a frame from the frame below it.

Mobile Scaffolds

Mobile scaffolds are supported scaffolds set on wheels or casters. They are designed to be easily moved and are commonly used for painting and plastering and similar activities where workers must frequently change position. When using mobile scaffolds:

- Use cross, horizontal, or diagonal braces to prevent scaffolds from collapsing and to secure vertical members.
- Scaffolds must be plumb, level, and square.
- All brace connections must be secure.
- Caster stems and wheel stems must be secured in scaffold legs.
- Lock or pin casters and wheels to prevent scaffold movement.

- Do not extend platforms beyond the base supports of the scaffold unless stability is ensured by the use of outrigger frames or equivalent devices.
- When it is necessary to level a mobile scaffold, screw jacks or equivalent means must be used.

Moving Mobile Scaffolds

- Employees are not allowed to be on a scaffold when it is being moved. Ensure that all employees are off of the scaffold before it is moved.
- When using manual force to move a scaffold, apply the force as close to the base as practicable, but not more than 5 feet above the supporting surface.
- Stabilize scaffolds so they do not tip when they are moved.
- Be sure to look overhead to ensure proper clearance; make sure there are no obstacles in the path of travel.

Suspension Scaffolds

The use of suspension scaffolds at UVA is severely restricted and limited to those employees who utilize such scaffolds on a regular basis. The requirements for their safe operation are extensive and are not covered in detail in this document. If the use of a suspension scaffold is indicated in a location where one has not been erected before, it is required that the scaffold system be designed by a qualified person, and approved by UVA Facilities Management Occupational Health and Safety. General safety requirements for suspension scaffolds are listed below:

- Support devices such as outrigger beams, cornice hooks, and parapet clamps must rest on surfaces that can support at least four times the scaffold's load when the scaffold operates at the rated load of the hoist.
- Outrigger beams must be made of structural metal or material of equivalent strength and must be restrained.
- Outrigger beams must be secured directly to the supporting surface or stabilized by counterweights.
- A competent person must evaluate all direct connections and confirm that scaffold-supporting surfaces can support the imposed loads; and engineer must design mason's multipoint adjustable suspension scaffold connections.
- Counterweights must be used only for their intended purpose and must not be changed or moved until the scaffold is dismantled.
- Sand and other similar material cannot be used as a counterweight; solid material such as large concrete or lead blocks are acceptable.
- Repaired wire rope cannot be used for suspension rope.
- The load end of wire suspension ropes must be fitted with properly sized thimbles and secured by eye splicing or equivalent means.
- A competent person must check wire ropes for defects before each workshift and damaged rope must be replaced.
- Swaged attachments or spliced eyes on wire suspension roped cannot be used unless they are made by a rope manufacturer or a qualified person.
- Emergency escape and rescue devices cannot be used as working platforms
- Tiebacks must be at least as strong as suspension ropes and must be secured to a structurally sound anchorage on the building or structure.
- Do not use standpipes, vents, other piping systems, or electrical conduit for anchorages.

Training Requirements

Each employee who performs work while on a scaffold shall be trained by a person qualified on the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the

procedures required to mitigate those hazards. Scaffolds are to be erected, moved, dismantled, or altered only by experienced and trained employees who have been selected for that work by a competent person. Specific requirements are as follows:

- Employees must be aware of the types of scaffold hazards. Examples include:
 - Electrical hazards, fall hazards, and falling object hazards in the work area
- Employees must understand correct procedures for erecting, dismantling, or otherwise altering a scaffold.
- Employees must understand how to determine the design criteria, maximum intended load capacity, and intended use of the scaffold.
- Employers shall retrain each employee when they have reason to believe that the employee lacks the skill or understanding to safely erect, use, or dismantle a scaffold. Such retraining is required in at least the following situations:
 - Changes at the worksite present a hazard for which an employee has not previously been trained.
 - Changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard for which an employee has not previously been trained.
 - Inadequacies in an affected employee's work indicate that the employee has not retained the necessary proficiency.

Handling Emergencies

Emergency procedures should be addressed before work begins. These procedures should identify key rescue and medical personnel, equipment available for rescue, retrieval methods, and first-aid requirements. The following lists identify safe guidelines for developing emergency response procedures, responding to emergencies, and investigating accidents:

Planning Guidelines – Before on-site work begins

- Determine if it is necessary to make fire department or emergency responders aware of the job specifications at the site and any factors that may slow response time.
- Consider creating joint training sessions between key on-site personnel and emergency responders.
- Document the rescue plan and make sure it is posted at the worksite.
- Mark the job site with signs and note the easiest access routes into and out of the site.

As On-Site Work Progresses

- Identify on-site equipment that can be used for rescue and retrieval (boomlifts, ladders, and forklifts).
- Maintain a current equipment inventory at the site.
- Re-evaluate and update the emergency-response plan if on-site work tasks change.

Emergency Response Actions

In order to be properly prepared for an emergency while working at height on a scaffold, it is necessary to have a plan in place prior to the start of work. Considerations should be made so as to enable access to the job site and the scaffold itself. Consider the use of accountability or permits to enter scaffolds to ensure supervisors are aware of who is working at height on certain scaffolds. Other emergency procedures are as follows:

- Call 911 or other designated emergency numbers.
- Make sure only qualified personnel attempt a technical rescue.
- Prohibit all nonessential personnel from the rescue area.

- Talk to the victim and determine the victim's condition, if possible.
- Do not attempt a solo rescue if the victim is suspended and wait for trained emergency responders.