POLICY: III: 06—Scaffolding

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APPROVED: Executive Director of Facilities and Construction: R. Fletcher

I. PURPOSE

To ensure a safe workplace based on the following formal, written procedures for scaffold work. These procedures will be reviewed and updated as needed to comply with OSHA regulations, and best practices in scaffolding operations.

II. DEFINITIONS

A. Competent Person – One who, because of training and experience, is capable of identifying hazardous or dangerous conditions in scaffolding operations and of training employees to identify such conditions.

B. Qualified Person – One who by reason of knowledge, experience, and training is certified and familiar with the operation to be performed and the hazards involved.

C. Bearer – A horizontal transverse scaffold member upon which the scaffold platform rests and which joins scaffold uprights, posts, poles and similar members. Also referred to as a "putlog."

D. Brace – A rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

E. Cleat – A structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats are also used to provide footing on sloped surfaces such as crawling boards.

F. Mobile scaffold – A powered or unpowered, portable, caster or wheel-mounted supported scaffold.

G. Outrigger – The structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for, and increased stability of, the scaffold.

H. Personal fall arrest system – A system used to arrest an employee's fall which consists of an anchorage point, connectors, and a body harness.

I. Platform – A work surface elevated above lower levels.

J. Rated load – The manufacturer's specified maximum load to be applied to a scaffold or scaffold component.

K. Supported scaffold – One or more platforms suspended by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

L. Suspended scaffold – One or more platforms suspended by ropes or other non-rigid means from an overhead structure(s).

M. Walkway – A portion of the scaffold platform used only for access and not as a work level.

III. RESPONSIBILITIES

A. Executive Director of Facilities and Construction – Responsible for the overall implementation of this procedure.

B. Directors – Ensures the necessary training is acquired by employees working on scaffolds or aerial platforms.

C. Supervisors – Responsible to ensure that scaffold and aerial platform work is performed by persons trained to perform such work.

D. Risk Management Safety and Training Coordinator – Responsible to ensure provisions of this procedure are kept updated according to the latest OSHA requirements. Responsible for scheduling necessary training and maintaining training records.

FM Competent Person – Responsible for the following:

1. Inspected scaffolding prior to each shift/day of use.
2. Not to intermix scaffold components manufactured by different manufacturers unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components manufactured by different manufacturers will not be modified in order to intermix them unless the FM competent person determines the resulting scaffold is structurally sound.
3. Evaluating direct connections and to confirm, based on that evaluation, that the supporting surfaces are capable of supporting the loads to be imposed before a suspension scaffold may be used.
4. Inspecting suspension scaffold ropes prior to each work shift and after every occurrence, which could affect a rope's integrity. Ropes shall be replaced if any of the conditions outlined in 29 CFR 1926.451(d) (10) exist.
5. Directly supervising the erection, moving, dismantling, or altering of scaffolds used by FM employees.

Qualified Person – Shall be responsible for the following:

1. Ensure scaffolding is inspected prior to each shift/day of use and performs a visual review prior to the use and contacts the qualified inspector should concerns arise.
2. The design, construction and loading of scaffolds.

3. Ensuring swaged attachments or spliced eyes on wire suspension scaffolds are not used unless the wire rope manufacturer makes them.

4. Training each employee who performs work while on a scaffold to recognize the hazards associated with the type of scaffold used and to understand the procedures to control or to minimize hazards. This training is to be documented and signed copies to be given to the Risk Management Safety and Training Coordinator.

IV. PROCEDURE

A. This procedure applies to all scaffold and aerial platform/lift operations for JMU. Scaffolding must be erected, altered, moved, and dismantled in accordance with applicable OSHA standards and under the supervision of a competent person. Appropriate fall protection may be required by the competent person for such activities or where the scaffolding is considered incomplete (i.e. missing parts due to area obstructions.)

Scaffold components cannot be mixed if there are from different manufactures unless they fit together without force. Scaffold components of dissimilar metals should not be used together, unless the competent person has determined that galvanic action will not reduce the strength of any component.

B. Base/Footing: Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills (or other adequate firm foundation.) The size of the mud sill shall be based on the type of soil the scaffold will be erected upon.

Minimum Mud Sill Size

Scaffolds 4 levels or less in height	2" x 10" pad, 12" - 18" long
Scaffolds > 4 levels on Type A Soil	2" x 10" pad, 18" long
Scaffolds > 4 levels on Type B Soil	2" x 18" x 18" pad
Scaffolds > 4 levels on Type C Soil	2" x 36" x 36" pad

The base and mud sill must provide a solid surface for the feet to sit upon so that the scaffold doesn't sink, move, settle, or shift. Unstable objects, such as bricks, cinder blocks, buckets, scrap lumber, etc., shall not be used to support or level scaffolds. Screw jacks must be used to level scaffolding on uneven surfaces. The maximum extension for a screw jack is 18 inches high. Most screw jacks will have a built-in stop so that the maximum height cannot be exceeded. (For mobile scaffolds, the maximum height of the screw jack is 12 inches.)

C. Plumb/Level/Square - Supported scaffold poles, legs, posts, frames, and uprights shall be plumb (i.e. perfectly vertical) and braced to prevent swaying and displacement. Cross bracing is required on both front and back sides of each scaffold buck or frame.

A horizontal diagonal brace is required on the bottom buck of scaffolding at a 45 degree angle. To check a scaffold for being plumb, use a level on two opposite uprights. To make sure the scaffold is level, use a level on a horizontal support or bearer. To ensure the scaffold is "square", use a tape measure and measure the distance between opposite corners. The two measurements should be equal.

D. Securing - Scaffold frames (i.e. bucks) must be joined together vertically by coupling or stacking pins (or equivalent means).

Scaffolds with a height-to-base width ratio of more than four-to-one shall be restrained from tipping over by guying, tying, bracing, or equivalent means. Guys, ties and braces shall be installed where horizontal members support both inner and outer legs. Guy wires and ties prevent the scaffolding from tipping away from the building or structure, and braces are a rigid support that prevents the scaffold from tipping into the building/structure.

E. Vertical Securing - If the base width is wider than three feet, the first tie will be a vertical distance of four times the base width and every **26 feet** vertically thereafter. For example, if the base width is five (5) feet, the first vertical tie will be (5 feet x 4) 20 feet from the ground.

If the base width is three (3) feet or less, the first tie will be a vertical distance of four (4) times the base width and every **20 feet** vertical thereafter. For example, if the base width is three feet, the first vertical tie will be (3 feet x 4) 12 feet from the ground.

F. Horizontal Securing - For long (running) scaffolds, guys, ties, and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet.

G. Platform/Decking - Platform/decking planks may be made of solid sawn or wood, manufactured steel, or manufactured aluminum. If solid sawn wood is used, it must be scaffold grade.

- Note: Once a plank has been used as a mud sill, it cannot be used as decking again.

Scaffolds must be fully planked or decked whenever possible. The space between the last plank and the uprights cannot exceed 9 1/2 inches. The space between planks cannot exceed one (1) inch, except where necessary for obstructions. Platforms and walkways, in general, must be at least 18 inches wide.

Where the platform will not be more than 14 inches from the face of the work (18 inches for plastering and lathing operations), fall protection is not required. The face of the work (ex. the side of a building) serves as the fall protection system.

The ends of each platform must be cleated or restrained by hooks (or equivalent) to prevent accidental displacement, or must extend at least six (6) inches over the centerline of the support.

- The maximum extension of the plank cannot be more than 12 inches for planks that are 10 feet long or less.
- For planks that are greater than 10 feet long, the maximum extension part the centerline of the support is 18 inches.
- Where platforms overlap to create a running scaffold, the overlap must occur only over a support and shall not be less than 12 inches unless nailed together.

Where a platform changes direction (ex. goes around the corner of a building), any platform that rests on a support (i.e. bearer) at an angle other than a right angle, shall be laid first. Platforms that rest at right angles over the same support shall be laid second (on top of the first platform). The objective is to reduce the tripping hazard by having the ends of the top layer of planks form a straight line, rather than a saw-toothed edge, which increases tripping hazards.

Wooden platforms (i.e. decking, planks) must not be painted to hide defects. They may, however, be treated periodically with clear preservatives, fire-retardants, and/or slip-resistant finishes.

H. Access – Proper access must be provided to access the work platform of the scaffold.

- Ladders that are a part of the scaffolding system, such as hook-on and attachable ladders, shall be positioned so that the bottom rung is not more than 24 inches above the supporting level.
- Portable extension ladders used to access the work platform must meet OSHA design and use criteria, which includes securing the ladder to the scaffold at the top and bottom and having the ladder extend at least three (3) feet past the landing surface. Ladders must also be positioned so as not to tip the scaffold.
- Stair towers must have hand and midrails on each side of the stairway. Stairs must be at least 18 inches wide and have a landing platform at least 18 inches long at each level. Stair treads must be of slip-resistant design. The riser height must be uniform, and the stair angle must be between 40 and 60 degrees from the horizontal.
- Where the frame of the scaffold will be used for access, the manufacturer must specify in writing that it was designed for such purposes. Design features include a rest platform every 35 feet, rungs at least 11 1/2 inches wide (8 inches for ladders built into the frame), and uniform rung spacing not exceeding 16 3/4 inches.

Top rails (manufactured after 1/1/2000) must be 38 - 45 inches above the platform surface. (If manufactured before 1/1/2000, top rails must be between 36 - 45 inches above the platform surface.) Top rails must be capable of supporting at least 200 pounds applied in a downward or outward direction.

- Note: Crossbracing is acceptable in place of a top rail when the crossing point of the two braces is between 38 - 48 inches above the work platform. It cannot serve as both a midrail and a top rail.

Midrails must be installed at a height approximately midway between the toprail and the platform surface. Midrails must be capable of supporting at least 150 pounds applied in a downward or outward direction.

- Note: Crossbracing is acceptable in place of a midrail when the crossing point of the two braces is between 20 - 30 inches above the work platform. It cannot serve as both a midrail and a top rail.

I. Personal Fall Arrest Systems – The scaffold competent person must determine personal fall protection requirements for employees performing erecting or dismantling activities, and for scaffold users if the scaffold is incomplete for any reason. Personal fall protection must be required and provided by the employer where the installation and use of such protection is feasible and does not create a greater hazard.

Personal fall arrest systems used on scaffolds are required when the guardrail system is incomplete or does not provide adequate protection. Lanyards or connecting devices must be connected to a vertical lifeline (1st choice), a horizontal lifeline (2nd choice), or a structural member of the scaffold (last choice.)

J. Falling Object Protection

1. Toeboards - Toeboards must be installed on work platforms where materials or tools will be in use. Toeboards must be installed not more than 1/4 inch above the platform and securely fastened. They may be made of solid material or mesh with openings no greater than 1 inch. Toeboards must be capable of withstanding at least 50 pounds applied in a downward or outward direction.

2. Nets and Platforms - Additional protection from falling debris and other small objects must be provided in areas where employees will be in the vicinity of scaffolds. Such protection may be in the form of:

   - Barricades to keep personnel out of a hazardous area.
   - Screens which are erected between the toe board and hand rail of the work platform.
   - Debris nets to catch materials before they hit the ground.
   - Canopy structures made of solid materials.

   Large or heavy materials stored on the scaffold platform must be located away from the edges of the work platform and secured, if necessary.

3. Hard Hats – Employees working on or from a scaffold, or in the vicinity of overhead work, such as that performed from a scaffold, aerial lift, roof, or crane must wear hard hats.

K. Mobile Scaffolding Requirements

In addition to requirements for proper erection of supported scaffolds (with the exception of the requirement for a base plate and mud sill), mobile scaffold casters and wheels shall be locked with positive wheel and/or wheel and swivel locks to prevent movement of the scaffold while the scaffold is in use.

Casters shall be pinned or otherwise secured to the scaffold legs or screw jacks.

The manual force used to move a mobile scaffold shall be applied as closely to the base of the scaffold as practical, but not more than five (5) feet above the supporting surface. Employees shall not be allowed to ride on scaffolds being moved unless the following conditions exist:

- The surface on which the scaffold is being moved is within three (3) degrees of level and free of pits, holes, and obstructions.
- The height-to-base width ratio of the scaffold during movement is two to one, or less.
- Outrigger frames, when used, are installed on both sides of the scaffold.
- The force of powered systems, when used, is applied directly to the wheels and does not produce a speed of more than one foot per second.
- Employees are within the guardrail system.

Horizontal diagonal bracing is required on mobile scaffolds near the bottom and every 20 feet vertically for support and stability.

Screw jacks shall be used to level the scaffold, if necessary. Maximum extension is 12 inches.

L. Scaffold Disassembly – The competent person will determine if personal fall protection systems are required for disassembly. Scaffolding must be disassembled in a safe and orderly fashion.

- Scaffolds should be disassembled from the top down; therefore, it is important that the scaffold be in good condition and as complete as possible before beginning.
- Check scaffolding to see it has been structurally altered in any way. Not only is it unsafe to work from such a scaffold, but it is equally dangerous to attempt to disassemble one.
- Reconstruct the scaffolding if components have been removed during the course of work.
- Use proper access (i.e. ladder.)
- Components must be lowered down by handing from one person to another, or lowered by attaching to a rope. Never throw or drop components to the ground, which may result in damage or structural defects.
- Components should be stockpiled in an orderly manner in an area protected from the elements.