

North Dakota State University

Scaffolding

I. Introduction

This Safe Operating Procedure has been limited to cover general requirements, tubular welded frame scaffolding, power scaffolding, elevating platforms, forklift personnel lifts, and telescoping scaffolding. The University Police and Safety Office (UP&SO) shall be contacted when a type of scaffolding not covered within this Safe Operating Procedure is to be used or is being considered for use.

II. Purpose

To establish requirements for the assembly, operations, maintenance and use of scaffolds, manually-propelled mobile scaffolds, fork-truck personnel lifts, and elevating work platforms.

III. Goal

To limit occupational exposure to injury and death when working with scaffolding

IV. Definitions

- A. Cleats: Structural block used at the end of a platform to prevent the platform from slipping off its supports.
- B. Coupler: A device for locking together the tubes of a tube and coupler scaffold.
- C. Elevating Platform: A platform that rises to any desired working height.
- D. Guardrail System: A vertical barrier erected to prevent employees from falling off a scaffold platform or walkway to lower levels.
- E. Independent Pole Scaffold: A supported scaffold consisting of a platform(s) resting on cross beams (bearers) supported by ledgers and a double row of uprights independent of support from any structure.
- F. Mid-Rail: Horizontal rail installed halfway between the top guardrail and the working platform.
- G. Mobile Scaffold: A powered or unpowered, portable, caster or wheel-mounted supported scaffold.
- H. Mudsill: Horizontal rail installed halfway between the top guardrail and the working platform.
- I. Outrigger: Structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for and increase stability of the scaffold.
- J. Scaffold: Any temporary elevated platform and its supporting structure used for supporting employees and/or materials.
- K. Toe board: A vertical barrier installed at deck level along the sides and ends of a platform or scaffold.
- L. Tubular Welded Frame Scaffold: A scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

- M. Tube and Coupler Scaffold: A scaffold consisting of a platform(s) supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

V. Procedure

For additional procedures/information concerning scaffolding assembly, use, parts, and accessories consult the manufacturer's guide.

A. General Requirements for all Scaffolds

1. Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction.
2. All scaffolding and elevating platforms, either leased or purchased, will have the manufacturer's safety instructions available for erection and use. Scaffolding and elevating platforms must be erected and used following the manufacturer's instructions and the Safe Operating Procedure. Scaffold components manufactured by different vendors will not be mixed.
3. 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, boxes, loose brick, or concrete blocks shall not be used to support scaffold planks.
4. Scaffold poles, legs and uprights must be plumb. Additionally, poles, legs, and uprights will be securely and rigidly braced to prevent swaying and displacement. Scaffolding will be tied and securely braced to the building or structure at least every 30 feet in length and 25 feet in height.
5. Scaffolds whose working platform is 10 feet or greater in height will have a standard guardrail, mid-rail, and toe board installed.
6. Scaffolding having a width of less than 45" must have standard guardrails on all open sides and ends when the working platform height is 4 feet or greater.
7. Guard rails and mid-rails will be at least 2" nominal diameter with posts spaced at least 6 feet, but not more than 8 feet on center. The guardrail shall be capable of withstanding a load of 200 pounds when applied from any direction and at any point on the top rail. The top rail will be placed at a height of 42" nominal from the top of the rail to the working platform. Toe boards will be at least 4" in height and mounted within 1/4" of the working platform. Where persons are required to work or pass under the scaffold, scaffolds will be provided with a screen between the toe board and the guardrail. The screen will extend along both ends and sides of the scaffold and consist of No. 18 U.S. gauge 1/2" wire mesh or equivalent.
8. Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.
9. Each platform on all working levels of scaffolds shall be fully planked or decked according to 29 CFR (Code of Federal Regulations) Part 1926.451(b).

10. Scaffolds and other devices mentioned or described in this section shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.
11. Head protection is required for workers on or around scaffolding when there is a danger of falling objects and head injury.
12. Working on scaffolds or platforms during storms, high winds, or when covered with snow or ice is prohibited.
13. The live load of the scaffolds or platforms will NOT be exceeded.
14. A visual inspection will be conducted immediately when a scaffold or platform has been damaged or weakened by any cause. The structure will not be occupied until the inspection has been completed and all identified discrepancies corrected.
15. Frames and accessories for scaffolds will be maintained in good repair. Every defect, unsafe condition, or noncompliance with the manufacturer's specifications or recommendations, or this Safe Operating Procedure will be corrected immediately. Any broken, bent, rusted, altered, or otherwise structurally damaged item/section or accessory will not be used.
16. Ladders or makeshift devices will not be used to increase the height of a scaffold or platform.
17. Scaffolds shall not be loaded in excess of the working load for which they are intended.
18. All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f. (Stress Grade) construction grade lumber.
19. All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used.
20. Wood planking will extend over end supports at least 6" and a maximum of 12". Additionally, planking will be cleated to prevent movement.
21. Tools and parts will not be carried in hands or pockets when ascending or descending access ladders. Tool belts, tool buckets and ropes, or other acceptable means will be used to raise and lower such items.
22. Slippery conditions on scaffolds and platforms will be eliminated as soon as they occur.
23. Cross braces, runners, and bearers will not be used for climbing. Access to scaffolds will be by stairs and ladders only.
24. All scaffold casters will have a positive wheel and/or swivel lock to prevent movement.
25. When leveling of the scaffold is required, screw jacks or other suitable means of adjusting the height must be provided in the base section of each scaffold. Maximum adjustment is 12 inches.
26. All sections of scaffolding will be locked together vertically by pins or other equivalent means.

B. Tubular Welded Frame Scaffolds

1. The assembly, erection, operations, use and maintenance of tubular welded frame scaffolds shall meet manufacturer's requirements and recommendations.
2. Mudsills will be placed under each leg. A continuous mudsill (which is under both legs of a side) that is 2" x 10" x 78" (minimum) is recommended. The minimum mudsill that will be used is 2" x 10" x 18" under each leg. Each leg base will be secured to the mudsill.
3. Adjustable screw base panels will be used on each scaffold leg. The minimum height of adjustable is 12" to the top of the adjustment screw.
4. Spacing of the panels or frames shall be consistent throughout the scaffold being assembled.
5. Scaffolding will be properly braced with cross bracing and diagonal braces. Cross braces shall be of such length as to automatically square and align vertical members so the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure and checked for proper engagement of the locks.
6. The frames will be placed on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

C. Elevating Platforms

1. Maintenance personnel will conduct preventative maintenance inspections.
2. Operators will complete an operational inspection prior to each use.
3. The live load must not exceed manufacturer's recommended capacities.
4. Outriggers shall always be fully extended and in firm contact with the supporting surface.
5. The platform will be operated following the manufacturer's instructions.

D. Aerial Lifts

1. Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.
2. Only authorized trained persons shall use an aerial lift.
3. Workers shall stand firmly on the floor of the basket, and *shall not* sit or climb on the edge or use planks, ladders, or other devices for a work position.
4. A body harness shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.
5. An aerial lift truck shall not be moved when the boom is elevated in a working position with someone in the basket. These units, if primarily designed as personnel carriers, shall have both platform (upper and lower) controls. Upper controls shall be on or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

E. Fork truck Personnel Lifts

1. Fork truck lifts shall have a guardrail, mid-rail, and toe board.
2. Personnel lifts shall be secured to the fork truck to prevent them from sliding off.
3. Employees shall not be allowed to ride scaffolds while moving horizontally.
4. A qualified person must be in the cab of the forklift if someone is on the platform.

F. Telescoping Scaffold

1. The scaffold will be thoroughly inspected prior to each use.
2. Outriggers will be fully extended prior to use. When the outriggers on the inside of the scaffold cannot be deployed, the scaffold shall be secured and braced to the structure if the top deck is raised.
3. Once the desired height is obtained, a safety pin will be placed in each leg of the scaffold. Height adjustment is in 6 inch increments.
4. Guardrails will be used at all times with this scaffolding.

V. Inspections

All scaffolds and their components will be thoroughly inspected before each erection to ensure the soundness of the scaffold. At a minimum:

- A. A visual inspection will be made of all tubular components. All foreign objects on the inside of the tubular part will be removed. If the object cannot be moved, the part will not be used.
- B. The exterior and interior of all legs, runners, braces, and bearers will be inspected for corrosion. All corrosion found will be corrected. A professional engineer will verify that the part which contained the corrosion meets the design criteria after the corrosion has been removed. Components with corrosion will not be used since their strength is unknown.
- C. Wood components will be inspected for proper grade and indications of damage or deterioration.
- D. Complete the scaffolding inspection report. Completed inspections will be maintained by the supervisor for at least one year.
- E. Before scaffold is erected, the surface of the proposed location will be inspected for stability, levelness, potential obstructions, and electrical hazards.
- F. Erected scaffolds will be visually inspected before each day's use to insure a safe condition is maintained.
- G. A complete inspection of all scaffolds and elevating platforms will be completed.
- H. Elevating platforms will be inspected by the operator prior to each use following the manufacturer's instruction manual.
- I. Maintenance personnel will conduct a preventative maintenance inspection of all elevating platforms. The inspection will follow the manufacturer's instruction manual.

VI. Responsibilities

A. Management will:

1. Ensure that the requirements of this standard practice remain current with applicable regulatory directives.
2. Advise and provide assistance to supervisors as requested.
3. Hold employees accountable for following this scaffolding standard practice.
4. Provide safety training for employees and the designated competent person.

B. Supervisor will:

1. Ensure all personnel assembling, disassembling or working on scaffolding or platforms are instructed on proper techniques, use, and safety rules of scaffolding.
2. Hold employees accountable for following the requirements of this standard practice.
3. Direct the removal of defective scaffolding from service until the defects are corrected.
4. Follow-up on inspections and maintenance of scaffolding according to the manufacturer's instructions and this Safe Operating Procedure.

C. Employees will:

1. Properly use scaffolds following the requirements contained in this Safe Operating Procedure and according to the manufacturer's instructions.
2. Immediately inform their supervisor of scaffold defects.
3. Attend mandatory scaffold and fall protection training.

D. Training

The Supervisor/Department shall have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used, and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:

1. The correct procedures for erecting, disassembling, moving, operating, inspecting, and maintaining the type of scaffold in question.
2. The nature of any electrical hazards, fall hazards and falling objects in the work area.
3. The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being use.
4. The proper use of the scaffold, and the proper handling of material on the scaffold.
5. The maximum intended load and the load-carrying capacities of the scaffolds used.
6. Any other pertinent requirements in this plan.

VII. Incident Investigations

All incidents/events, regardless of their nature, shall be reported immediately to the University Police and Safety Office (UP&SO). The supervisor must also complete an investigation, identify causes, and document corrective action. It is an integral part of the safety program that documentation takes place as soon as possible so that the cause and means of prevention can be identified to prevent reoccurrence.