

# **North Dakota State University**

## **Scaffolding - Standard Practice**

**University Police and Safety Office**

# **Scaffolding**

## **Table of Contents**

<b>I.</b>	<b>Purpose</b> .....	1
<b>II.</b>	<b>Scope</b> .....	1
<b>III.</b>	<b>Definitions</b> .....	1
<b>IV.</b>	<b>Procedure</b> .....	2
	A.    General Requirements For All Scaffolds .....	2
	B.    Tubular Welded Frame Scaffolds .....	4
	C.    Elevating Platforms .....	4
	D.    Aerial Lifts .....	4
	E.    Forktruck Personnel Lifts .....	5
	F.    Telescoping Scaffold .....	5
<b>V.</b>	<b>Inspections</b> .....	5
<b>VI.</b>	<b>Responsibilities</b> .....	6
	A.    Management .....	6
	B.    Supervisors .....	6
	C.    Employees .....	6
	D.    Training .....	6
<b>VII.</b>	<b>Incident Investigations</b> .....	7

## I. 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.

## II. Scope

This Standard Practice 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 shall be contacted when a type of scaffolding not covered within this Standard Practice is to be used or is being considered for use.

## III. Definitions

- A. Cleats: Wooden “stops” attached to the bottom side of each end of scaffold planks to limit longitudinal movement.
- B. Coupler: A device for locking together the component parts of a tubular metal scaffold.
- C. Elevating Platform: A platform that raises to any desired working height.
- D. Guardrail: A barrier secured to uprights and built along the exposed sides and ends of a platform to prevent falls.
- E. Independent Pole Scaffold: A scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing.
- F. Manually-Propelled Mobile Scaffold: A portable rolling scaffold supported by casters.
- G. Mid-rail: Horizontal rail installed halfway between the top guardrail and the working platform.
- H. Mudsill: A 2" x 10" x 18" (minimum) wood plate that is used to distribute the scaffolding load over a suitable ground area. The size of the mudsill is determined by the load carried over a particular ground area and by the nature of the soil supporting these sills.
- I. Outriggers: Supports extending off a scaffold structure or elevating platform to increase stability.
- J. Planks: 2" x 9" or wider wooden or aluminum planks used for scaffold decking.
- K. Scaffold: Any temporary elevated platform and its supporting structure used for personnel and/or materials.
- L. Toeboard: A vertical barrier installed at deck level along the sides and ends of a platform or scaffold.
- M. Tubular Welded Frame Scaffold: A scaffold structure consisting of tubing that serves as posts, bearers, braces, ties, and runners. The various members of the scaffold are connected by welding.
- N. Tube and Coupler Scaffold: A scaffold structure consisting of tubing that serves as posts, bearers, braces, ties and runners. Special couplers are used to connect various members to one another.

- O. Live Load: A load imposed by workers, materials, and equipment at the working level of the scaffold.

#### **IV. 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 this Standard Practice. 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 toeboard installed.
6. Scaffolding having a width of less than 45 inches must have standard guardrails on all open sides and ends when the working platform height is 4 feet or greater.
7. Guard rails and midrails 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. The midrail will be placed approximately halfway between the top rail and the working platform. Toeboards 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 toeboard 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. 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.
10. Head protection is required for workers on or around scaffolding when there is a danger of falling objects and head injury.
11. Working on scaffolds or platforms during storms, high winds or when covered with snow or ice is prohibited.
12. The live load of the scaffolds or platforms will NOT be exceeded.
13. 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.
14. 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 Standard Practice will be corrected immediately. Any broken, bent, rusted, altered, or otherwise structurally damaged item/section or accessory will not be used.
15. Ladders or makeshift devices will not be used to increase the height of a scaffold or platform.
16. Scaffolds shall not be loaded in excess of the working load for which they are intended.
17. All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f. (Stress Grade) construction grade lumber.
18. All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used.
19. Wood planking will extend over end supports at least 6" and a maximum of 12". Additionally, planking will be cleated to prevent movement.
20. 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.
21. Slippery conditions on scaffolds and platforms will be eliminated as soon as they occur.
22. Cross braces, runners, and bearers will not be used for climbing. Access to scaffolds will be by stairs and ladders only.
23. All scaffold casters will have a positive wheel and/or swivel lock to prevent movement.
24. 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.
25. All sections of scaffolding will be locked together vertically by pins or other equivalent means.

- B. Tubular Welded Frame Scaffolds
1. The assembly, erection, operation, 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 inches 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 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. Forktruck Personnel Lifts

1. Forktruck lifts shall have a guardrail, mid-rail, and toeboard.
2. Personnel lifts shall be secured to the forktruck 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, level, 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. This 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. Supervisors 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 standard practice.
- C. Employees will:
1. Properly use scaffolds following the requirements contained in the standard practice 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
1. 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:
    - a. The correct procedures for erecting, disassembling, moving, operating, inspecting, and maintaining the type of scaffold in question.
    - b. The nature of any electrical hazards, fall hazards and falling objects in the work area.
    - c. The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used.
    - d. The proper use of the scaffold, and the proper handling of material on the scaffold.
    - e. The maximum intended load and the load-carrying capacities of the scaffolds used
    - f. 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. The supervisor must also complete an investigation, identifying causes and documenting corrective action. It is an integral part of the safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent reoccurrence.