



Don H. Mahaffey Drilling Co.

SCAFFOLD SAFETY



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1 OBJECTIVE

In efforts to reduce occupational illness and injury due to scaffold hazards, Don H. Mahaffey Drilling Co. has developed and implemented the Scaffold Safety Manual. This manual is designed as to correspond with the scaffold standards set forth under the California Code of Regulations, Title 8, Sections 1637 – 1667 and will be used to train all Don H. Mahaffey Drilling Co. employees.

2 MANUAL ADMINISTRATOR

Don H. Mahaffey Drilling Co. has designated Ashley Mahaffey Tullius as the manual administrator. Ashley Mahaffey Tullius is responsible for enforcing the scaffold standards and/or designating other members of management or supervisors to assist in enforcement, maintaining and reviewing the Scaffold Safety Manual as needed, and maintaining records pertaining to scaffold safety.

3 SCAFFOLD SAFETY, AN EXPLANATION OF

Scaffolding can provide an efficient and safe means to perform work. However, unsafe scaffolding procedures can lead to accidents, serious injuries and death. This guide makes clear that planning ahead and efficient training for the erection, use and dismantling of scaffolding can substantially reduce scaffold-related accidents and injuries. Compliance with the manufacturer's instructions, the use of this guide and compliance with all scaffolding standards will help ensure a safer workplace for employees.

4 SCAFFOLD HAZARDS

The scaffolding industry has long put its workers in hazardous situations to provide safe working areas for other trades and end users of scaffolding structures. Accidents involving scaffolding mainly involve workers falling, incorrect operating procedures, environmental conditions and falling materials caused by equipment failure.

The causes of scaffolding accidents include failures at attachment points, parts failure, inadequate fall protection, improper construction or work rules, and changing environmental conditions (high winds, temperature extremes or the presence of toxic gases). Additionally, overloading of scaffolding is a frequent cause of major scaffold failure. The following sections shows hazards that have been identified and cases of accidents.

4.1 Fall Hazards

- 4.1.1 Falls of persons from height represent the most serious safety risk in the construction industry. Many of these falls are from unsafe working places, or from unsafe means of access to working places.

4.1.2 Case

A crew was working on a scaffold applying stucco to a six-story college dormitory. An employee on the fifth floor stepped on a guardrail to access the next level of the scaffold. The guardrail gave way allowing the employee to fall 48 feet to his death.

4.2 Falling objects

4.2.1 Falling or flying objects on a worksite can expose workers to relatively minor injuries, such as cuts and abrasions, as well as more serious injuries, such as concussions or blindness. Working beneath scaffolds or other areas where overhead work is being performed puts workers at risk from falling objects. Flying objects become a concern when workers are using power tools or performing tasks that involve pushing, pulling or prying.

4.2.2 Case

At the material time of the accident, a delivery worker was operating a hoist to transport concrete bricks to the top floor. When the platform of the hoist moved up to the 10th floor after it was loaded with concrete bricks by workers on the ground, some concrete bricks were displaced due to the vibration during lifting. As the frame of the hoist was unfenced, a displaced brick fell from the frame and hit the head of a worker on the ground.

4.3 Electrical hazards

4.3.1 Electricity is another major hazard when using scaffolds. Electrical lines are generally elevated to keep individuals a safe distance away. However, the purpose of the scaffold is obviously to allow one to work at these heights which brings workers close to this hazard.

4.3.2 Case

On November 24, 1986, seven employees of a masonry company were erecting a brick wall from a tubular, welded-frame scaffold approximately 24 feet high. The scaffold had been constructed approximately 21 inches across from a 7,620-volt power line. A laborer carried a piece of wire reinforcement (10 feet long by 8 inches wide) along the top section of the scaffold and contacted the power line with it. The laborer, who was wearing leather gloves, received an electric shock and dropped the wire reinforcement, which fell across the power line and simultaneously contacted the metal rail of the scaffold, energizing the entire scaffold. A 20-year-old bricklayer standing on the work platform in contact with the main scaffold was electrocuted.

4.4 Overloading (scaffold collapsing)

4.4.1 Overloading scaffolds is another major hazard. The mason industry by nature requires heavy loads on scaffolds. Too often contractors place excessive strain on scaffolds as shown by the following case.

4.4.2 Case

August of 2000, a scaffold collapsed in Massachusetts killing two workers. The accident investigation showed that the scaffold was overloaded with

brick, debris and excess scaffold planking. None of the workers had received training nor was the scaffold inspected by a competent person. In addition, a cross bracing was missing from the base of the scaffold.

4.5 Preventing Hazards

Preventing injuries during scaffold operations can be accomplished through following the guidelines and safe work practices set forth under the scaffold standard and Don H. Mahaffey Drilling Co. policies. The following gives a general overview of how to prevent injury from scaffold hazards.

- 4.5.1 Proper training- Every worker should be well acquainted with the tools and equipment used for the operation at hand. Proper scaffold training can enhance the safety of a work place.
- 4.5.2 Competent Person- A trained "competent person" will supervise all scaffold erection, dismantling, or alteration activity. Having a trained "competent person" will ensure correct scaffold procedures, thus preventing hazards that may be caused by improper scaffold erection, dismantling, or altering.
- 4.5.3 Correct Ladder and Guardrail Use – Size specific guardrails are required on any scaffolding or fall hazard more than 10 feet above the ground. This will aid in reducing fall accidents.
- 4.5.4 Proper Personal Protective Equipment (PPE) – Specifically fall protection will be used at all jobsites where workers are exposed to potential hazards. PPE also includes proper head equipment, clothing, footwear, etc. Employees should refer to the PPE Program and Fall Protection Program for further training.
- 4.5.5 Abiding Scaffold Standards- Employees should take note that they too are obliged to follow the safety and health of themselves and others at the workplace, and to follow the safety rules and work procedures laid down.

5 GENERAL REQUIREMENTS

5.1 Provision

- 5.1.1 Scaffolds will be provided for all work that cannot be done safely by employees standing on permanent or solid construction at least 20 inches wide, except where such work can be safely done from ladders.

Exceptions:

- 1. *Work of a limited nature and of short duration when the permanent or solid construction is less than 20 inches in width and the fall distance does not exceed 15 feet in height and provided adequate risk control is recognized and maintained under competent supervision.*
- 2. *Work of a short duration from joists or similar members at 2 feet or closer centers, planks resting on these members forming a plank platform 12 inches wide or equivalent protection.*

- 5.1.2 All scaffolds will be subject to a visual inspection by a competent person prior to each use.
- 5.1.3 Defective scaffolds will be tagged when defective or unsafe conditions are found.

5.2 Scaffold Design and Construction

Scaffolds will be constructed of wood or other suitable materials such as steel or aluminum members of known strength characteristics. Where materials other than wood are used, or where scaffold designs differ from those specified in California Code of Regulations, Title 8 Orders, the scaffold and its parts must provide a degree of strength, rigidity and safety equivalent to that provided by the described scaffold it replaces.

5.3 Load Capacity

- 5.3.1 Each scaffold will be designed and constructed using a dead load safety factor that will ensure the scaffold supports, without failure, its own weight and 4 times the maximum intended working (live) load applied or transmitted to it. Maximum intended working loads will be as follows:
 - a. Light-duty scaffolds: 25 pounds per square foot of work platform.
 - *Exception: Light-duty interior scaffolds will adhere to the loading requirements contained in §1640(c)(1) under California Code of Regulations, Title 8.*
 - b. Medium-duty scaffolds: 50 pounds per square foot of work platform.
 - c. Heavy-duty scaffolds: 75 pounds per square foot of work platform.
 - d. Special-duty scaffolds: exceeding 75 pounds per square foot of work platform as determined by a qualified person or a Civil Engineer currently registered in the State of California and experienced in scaffold design.
 - e. Engineered scaffolds: as determined by a Civil Engineer currently registered in the State of California and experienced in scaffold design.
- 5.3.2 A scaffold will not be subjected to loads greater than its maximum intended working load.
- 5.3.3 Manufactured scaffolds will be used in accordance with the manufacturer's recommendations.
- 5.3.4 A qualified person will determine the maximum intended working loads for scaffolds that are neither manufactured nor engineered.
- 5.3.5 The maximum intended working load for each scaffold will be posted at a conspicuous location at each jobsite or be provided to each supervisory employee who will have it readily available at the jobsite.
- 5.3.6 Scaffolds will not be overloaded. Material will not be allowed to accumulate to the extent that a scaffold is subjected to loading it is not designed to support.

5.4 Anchorage and Bracing

Anchorage and bracing will be such that scaffolds and falsework will be prevented from swaying, tipping, or collapsing.

5.5 Extension Planking

- 5.5.1 Extension planking of the finger type will be made with at least 5 fingers on each side. These fingers will be at least 1-inch by 2 1/8-inch selected straight-grained Douglas fir or material of equal strength. All metal fittings will be adequate to maintain the structural qualities of the device.
- 5.5.2 The length of the extended planking will not exceed 12 feet 6 inches, and the actual mechanical overlap between the 2 halves will be not less than 1/8 of the length of the extended planking. A substantial stop will be provided to maintain this overlap.
- 5.5.3 Not more than one employee will be permitted at one time on any extension planking that is more than 3 feet in height.
- 5.5.4 Extension planking will not be used as a platform on ladder-jack, suspended, or other unstable scaffolds.

5.6 Label, Design and Construction for Scaffold Planking

The following are the minimum labeling, design and construction requirements for scaffold planking, such as solid sawn planks, manufactured platforms of wood (including laminated planks), metal planking, and planking manufactured from other materials.

- 5.6.1 Except as specified in other California Code of Regulations, Title 8 Orders, all solid sawn planking will be at least equivalent to 2-inch x 10-inch (nominal) lumber selected for scaffold grade plank as defined in §1504, Lumber - "Structural Plank."

5.6.2 Maximum Permissible Span

- a. The maximum permissible spans for Douglas Fir and Southern Pine planking for 2 x 10-inch (nominal) or 2 x 9-inch (rough) planks will be as shown in the following Table:

Working (Live) Load (psf.)	25	50	75
Permissible Span (ft.)	10	8	7

- b. The maximum permissible spans allowed for other wood species of scaffold planking will not exceed 10 feet and will be determined by a licensed professional engineer.

5.6.3 Manufactured Scaffold Planking

- a. All manufactured scaffold planking including, but not limited to, engineered wood products, laminated veneer lumber, metal, composite,

plastic, or any other manufactured planks will be capable of supporting, without failure, its own weight and 4 times the maximum intended working (live) load.

- b. Manufactured planks with spans in excess of 10 feet will be labeled to indicate the maximum intended working (live) load.
- c. Manufactured scaffold planks will be used in accordance with the manufacturer's specifications.

- 5.6.4 Prior to being placed in service, all laminated veneer lumber scaffold planks, manufactured after December 2, 2010 will be labeled with the seal of an independent, nationally recognized, inspection agency approved by the International Accreditation Services (IAS) certifying compliance with ASTM D 5456-09a and ANSI/ASSE A10.8-2001, Section 5.2.10.
- 5.6.5 Prior to being placed into service, all solid sawn wood scaffold planks will be certified by, or bear the grade stamp of, a grading agency approved by the American Lumber Standards Committee.
- 5.6.6 All scaffold planks will be visually inspected for defects before use each day.
- 5.6.7 Defective or damaged scaffold planks will not be used and will be removed from service.
- 5.6.8 Except as specified in other California Code of Regulations, Title 8 Orders, a scaffold plank will not overhang its support by more than 18 inches, unless access to this overhanging portion is prevented by a guardrail, or other barrier, or unless the other plank end is securely anchored.

5.7 Scaffold Lumber

- 5.7.1 Scaffold lumber, except for planks, used on suspended or ladder-jack scaffolds, will be the equivalent of "selected lumber," free from damage that affects its strength. (See definitions for lumber specifications.)
- 5.7.2 Inspection of Lumber.
All scaffold lumber will be visually inspected for defects before and during use. Defective lumber will not be used.

5.8 Nailing

- 5.8.1 All nailed joints in scaffolds and wooden falsework must contain enough properly placed nails of ample size to carry the loads they are intended to support.
- 5.8.2 Nailed joints or connections will not be used to support concrete hoppers with a capacity in excess of 1/2 cubic yard.
- 5.8.3 Double-headed nails will not be used for attaching railings or in other service where the projections might catch on the clothing of workers or create similar hazards.

- 5.8.4 No nail smaller than 8-penny will be used in the construction of scaffolding.
- 5.8.5 All nails will be driven full length or to the first head when double-headed nails are used.
- 5.8.6 The minimum number of nails per connection will be in accordance with the following table:

	1" x 6" Material	1" x 8" Material	2" Material
Ledgers	4-8d	5-8d	2-16d
Ribbons	3-8d	3-8d	
Braces	3-8d	3-8d	2-16d
Guardrails	2-8d	2-8d	2-16d

- 5.8.7 Lubricated or wax-coated nails will not be used in the construction of scaffolds, falsework, or other temporary installations.

5.9 Erection and Dismantling

- 5.9.1 The erection and dismantling of scaffolds or falsework will be performed under the supervision and direction of a qualified person.
- 5.9.2 Erection and dismantling of scaffolds will be performed in accordance with good engineering practice. Where engineering design is required by California Code of Regulations, Title 8 Orders, the engineering drawings will be made available at the job site during erection or upon request by the Division.
- 5.9.3 All required ties to the structure will be installed as soon as the scaffold has been completed to the tie-in area during erection.
- 5.9.4 Ties will only be removed during dismantling as the work progresses downward unless other methods are used to prevent the scaffold from falling over.
- 5.9.5 No structural members will be removed from scaffolds during dismantling operations below the level being dismantled.
- 5.9.6 Where work platforms are proposed, guardrails will be installed before other work not directly related to scaffold erection is permitted to begin.
- 5.9.7 The requirements of sections 5.9.1 through 5.9.6, inclusive, may be temporarily suspended for short durations, provided adequate risk control is recognized and maintained under immediate, competent supervision.

5.10 Removal of Braces

Scaffolds or falsework installations will not be altered by removing uprights, braces, or supports unless other members providing equivalent strength are substituted.

5.11 Access

- 5.11.1 A safe and unobstructed means of access, such as a walkway, stair, or ladder will be provided to all scaffold platforms.
- 5.11.2 Climbing ladders or stairways on scaffolds used for access and egress will be affixed or built into the scaffold by proper design and engineering, and will be so located that their use will not disturb the stability of the scaffold.
 - a. Manufactured hook-on and attachable ladders will be securely attached to the scaffold and:
 - 1. Will be specifically designed for the type of scaffold used;
 - 2. Will have a minimum rung length of 11-1/2 inches (29 cm); and
 - 3. Will have uniform spaced rungs with a maximum spacing between rungs of 16-3/4 inches.
 - b. If a ladder is used as a means of access to the scaffold, it will be securely attached and will comply with Article 25 of the Construction Safety California Code of Regulations, Title 8 Orders.
 - c. Permanent stairways will comply with the applicable provisions of the General Industry Safety California Code of Regulations, Title 8 Orders. Prefabricated scaffold steps or stairs, manufactured on or before May 28, 2005, will comply with the design, manufacture and installation requirements of either the American National Standard ANSI A10.8-1988, Scaffolding-Safety Requirements, or the ANSI/ASSE A10.8-2001, Safety Requirements for Scaffolding, which are hereby incorporated by reference. Prefabricated scaffold steps or stairs, manufactured after May 28, 2005, will comply with the design, manufacture and installation requirements of ANSI/ASSE A10.8-2001, Safety Requirements for Scaffolding.
 - d. Horizontal members of end frames may be designed and used as a climbing device provided that the steps are:
 - 1. Reasonably parallel and level.
 - 2. Arranged to form a continuous ladder as required in §1644(a)(8).
 - 3. Provided with sufficient clearance to provide a good handhold and foot space.

6 WORKER SAFETY

6.1 Worksite Conditions

- 6.1.1 No worker will be permitted to work on a scaffold platform where slippery conditions exist unless such conditions are a necessary part of the work.
- 6.1.2 Work on or from scaffolds is prohibited during storms or high winds unless a qualified person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system, as defined in California Code of Regulations, Title 8, Section 1504 or wind screens. Wind screens will not be used unless the scaffold is secured against the anticipated wind forces imposed.

6.2 Overhead Protection

Workers on scaffolds who are exposed to overhead hazards will be provided with overhead protection or other means that will effectively eliminate the hazard.

7 ADDITIONAL SAFETY REGULATIONS

7.1 Sloped Platforms

Platforms will not be sloped more than 2 feet vertically to 10 feet horizontally and will be positively secured against slipping from supports.

7.2 Bolted Connections

Bolts used in the construction of scaffolds will be of a size and in sufficient numbers at each connection to develop the designed strength of the scaffold. (See Plate B-31, Appendix under California Code of Regulations, Title 8, Section 1938).

7.3 Hoisting of Materials

Where materials are line-hoisted onto a scaffold, a tag line will be used where necessary to control the load.

7.4 Platforms

7.4.1 Platform Planks at Corners

When a scaffold materially changes its direction, the platform planks will be laid to prevent tipping. The planks that meet the corner ledger at an angle will be laid first, extending over the diagonally placed ledger far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at an angle will be laid so as to extend over and rest on the first layer of planking.

7.4.2 Wood platforms will not be covered with opaque finishes, except that platform edges may be covered or marked for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.

7.4.3 Platforms, including, but not limited to, those consisting of solid sawn wood planks, engineered wood products, laminated veneer lumber, metal, composite, plastic, or any other manufactured planks, will not deflect more than 1/60 of the span when loaded to the manufacturer's recommended maximum load.

8 TYPES OF SCAFFOLDS

The scaffold(s) selected for an operation will be furnished, erected and dismantled in accordance with the California Code of Regulations, Title 8, Article 22 - 23 and the manufacturer manual pursuant to the type of scaffold being used. The following is a list of scaffolds that may be used and will adhere to the additional, specific requirements.

- Light-Duty Wooden Pole Scaffolds;
- Heavy-Trade Wooden Pole Scaffolds;
- Timber Scaffolds;
- Scaffolds over 60 ft. in Height;
- Metal Scaffolds;
- Outrigger and Bracket Scaffolds;
- Tower Scaffolds and Rolling Scaffolds, Wood or Metal;
- Suspended Scaffolds;
- Bricklayers' or Masons' Suspended Scaffolds;
- Horse Scaffolds;
- Boatswains' Chairs;
- Interior Hung Scaffolds
- Ladder-Jack Scaffolds;
- Float Scaffolds;
- Needle-Beam Scaffolds;
- Staging Supported by Catenary or Horizontal Wire Ropes;
- Bricklayers' Square Scaffolds;
- Suspended, Power-Driven Scaffolds;
- Window Jack Scaffolds; and
- Pump Jack Scaffolds.

9 PROHIBITED TYPES OF SCAFFOLDS

Lean-to or jack scaffolds, shore scaffolds, nailed brackets, loose tile, loose brick, loose blocks, stilts, or other similar unstable objects will not be used as working platforms, or for the support of such platforms. See Plate B-40, Appendix under California Code of Regulations, Title 8, Section 1938.

Exception: Bricklayer's "jump boards" no higher than 20 inches above the regular scaffold platform are acceptable for such service when supported by piers of carefully piled bricks or concrete blocks.

10 TRAINING

- 10.1 Employees will be instructed by a qualified person in the safe use of scaffolds in accordance with the manufacturer's operating instructions and Don H. Mahaffey Drilling Co.'s Injury and Illness Prevention Program.
- 10.2 Instruction for employees who erect, disassemble, move, use, repair, maintain or inspect scaffolds will include, but not be limited to, training in:
 - a. The provisions of this program;
 - b. The correct procedures for performing their assigned duties;
 - c. The nature of hazards associated with the equipment, including electrical hazards, fall hazards, and falling object hazards in the work area and correct procedures for dealing with those hazards;
 - d. The safe operation and use of scaffolds and the proper handling of materials on scaffolds; and
 - e. The maximum load capacity of the scaffold based upon installed configuration.

10.3 Training will occur:

- a. Prior to be assigned to job duties involving the use of scaffolds; and
- b. At regular intervals thereafter to ensure continued safe use of scaffolds.