



INDIANA UNIVERSITY

OFFICE OF THE EXECUTIVE VICE PRESIDENT
FOR UNIVERSITY ACADEMIC AFFAIRS

University Environmental Health and Safety

Scaffold Safety Program

October 22, 2014

1. INTRODUCTION

1.1. Purpose

Indiana University Environmental Health and Safety (IUEHS) has developed this Scaffold Safety Program to ensure a safe work environment and to protect the health and safety of Indiana University staff. This program is written in accordance with the requirements of Occupational Safety and Health Administration (OSHA) [29 CFR 1926 Subpart L](#) and [1910.28](#).

1.2. Scope

This Program applies to all faculty and staff and establishes safety requirements for the proper construction, inspection, maintenance, operation, and use of supported scaffolding. Excluded from this program are aerial lifts which are addressed in the IU Aerial Lift Program.

Scaffolding covered under this program includes; frame and fabricated, mobile, tube and coupler, and pole scaffolding.

2. AUTHORITY AND RESPONSIBILITY

2.1. Environmental Health and Safety is responsible for:

- 2.1.1. Reviewing this Program to ensure compliance with current regulations;
- 2.1.2. Reporting any hazardous conditions that are discovered to the responsible department; and
- 2.1.3. Auditing departments for compliance with this Program.

2.2. Departments are responsible for:

- 2.2.1. Ensuring all affected employees follow the prescribed practices within this Program;
- 2.2.2. Designating a competent person;
- 2.2.3. Ensuring all affected employees have received training in accordance with this program;
- 2.2.4. Designating a qualified person to design scaffolding; and
- 2.2.5. Ensuring all inspections are performed.

2.3. Employees are responsible for:

- 2.3.1. Complying with the practices within the Scaffold Safety Program;
- 2.3.2. Reporting problems or defects to the competent person; and
- 2.3.3. Attending required training on the use of scaffolding.

3. PROGRAM ELEMENTS

3.1. General Requirements for Scaffolds

- 3.1.1. Each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it;
- 3.1.2. Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.451 and 29 CFR 1910.28;
- 3.1.3. Stationary scaffolds over 125 feet in height and rolling scaffolds over 60 feet in height shall be designed by a professional engineer;
- 3.1.4. Prior to erection, all job sites shall be inspected to determine the site's ability to support the structure and for the location of electrical power lines, overhead obstructions, wind conditions, and the need for overhead protection or weather protection coverings; and
- 3.1.5. Scaffolds shall be erected, moved, or disassembled only under the supervision of competent persons.

3.2. Use Requirements

- 3.2.1. The use of shore scaffolds and lean-to-scaffolds is strictly prohibited;
- 3.2.2. All employees are prohibited from working on scaffolds covered with snow, ice or other slippery materials;
- 3.2.3. Work on or from scaffolds is prohibited during storms or high winds unless a competent 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 or a wind screen;
- 3.2.4. Scaffold and scaffold components shall be inspected for visible defects by a competent person before each work shift and after any occurrence with could affect a scaffold's structural integrity. Any part of a scaffold damaged or weakened such that its strength is less than that required in the section 29 CFR 1926.451(a) shall be immediately repaired or replaced, braced to meet those provisions, or removed from service until repaired;
- 3.2.5. Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement, or for mobile scaffolds; and
- 3.2.6. Clearance Distances between Scaffolds and Power lines:
 - 3.2.6.1. Appendix B provides the clearance distances between scaffolds and power lines, or any other conductive material, while being erected, used, dismantled, altered or moved.

3.3. Erecting and Dismantling Scaffolding

Erectors and dismantlers of scaffolding are those whose principal activity involves assembling and disassembling scaffolding. Scaffolding is required to be designed by qualified persons. Employees who erect and dismantle scaffolding must be trained by a competent person.

3.3.1. Qualified Persons

Scaffolds must be designed by a qualified person and be constructed and loaded in accordance with that design. The qualified person is responsible for:

- 3.3.1.1. Designing and loading scaffolds in accordance with design specifications;
- 3.3.1.2. Training employees who will serve as competent persons working on the scaffolds to recognize the associated hazards and understand procedures to control or minimize those hazards.

3.3.2. Competent Person

A competent person is one who is capable of identifying existing and predictable hazards and has the authority to take prompt corrective measures to eliminate the hazards. Each department that owns or uses scaffolding must designate a competent person. The competent person is responsible for:

- 3.3.2.1. Directing employees, who erect, dismantle, move or alter scaffolding;
- 3.3.2.2. Determining if it is safe for employees to work from a scaffold during storms or high winds, and ensure that a personal fall arrest system is in place;
- 3.3.2.3. Training employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolding to recognize associated work hazards;
- 3.3.2.4. Inspecting scaffolds and scaffold components for visible defects before each work shift, and after any occurrence which could affect the structural integrity, and to authorize prompt corrective action;
- 3.3.2.5. For erectors and dismantler's determining the feasibility and safety of providing fall protection and access;
- 3.3.2.6. For scaffold components:
 - 3.3.2.6.1. Determining if a scaffold will be structurally sound when intermixing components from different manufacturer's; and
 - 3.3.2.6.2. Determining if galvanic action has affected the load capacity when using components of dissimilar metals.

3.4. Platforms

- 3.4.1. Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows:
 - 3.4.1.1. Platforms shall be entirely planked and decked with space not more than one inch wide between the platforms and uprights;
 - 3.4.1.2. The platform shall not deflect more than 1/60 of the span when loaded;
 - 3.4.1.3. All platforms shall be kept clear of debris or other obstructions that may hinder the working clearance on the platform;
 - 3.4.1.4. Wood planks shall be inspected to see that there are graded for scaffold use, are sound and in good condition, straight grained, free from saw cuts, splits and holes;
 - 3.4.1.5. Platforms and walkways shall be at least 18 inches in width. When the work area is less than 18 inches wide, guardrails and/or personal fall arrest systems shall be used;
 - 3.4.1.6. Where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches unless the platforms are nailed together;
 - 3.4.1.7. The front edge of all platforms shall not be more than 14 inches from the face of the work, unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used;
 - 3.4.1.8. Each end of a platform 10 feet or less in length shall not extend over its support more than 12 inches unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end;
 - 3.4.1.9. A platform greater than 10 feet in length shall not extend over its support more than 18 inches, unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end;

- 3.4.1.10. Wood surface shall not be covered with opaque finishes, other than the edges for making identification;
- 3.4.1.11. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating shall not obscure the top or bottom wood surfaces;
- 3.4.1.12. Each end of the platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches; and
- 3.4.1.13. Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component.

3.5. Criteria for Support Scaffolds

Supported scaffolds are platforms supported by legs, outriggers beams, brackets, poles, uprights, posts, frames, or similar rigid support. The structural members, poles, legs, posts, frames, and uprights, must be plumb and braced to prevent swaying and displacement.

- 3.5.1. Supported scaffolds with a height to base width ratio of more than 4:1 must be restrained by guying, tying, bracing or an equivalent means.
- 3.5.2. The following placements must be used for guys, ties, and braces;
 - 3.5.2.1. Install guys, ties, or braces at the closest horizontal member to the 4:1 height and repeat vertically with the top restraint no further than 4:1 height from the top;
 - 3.5.2.2. Vertically – every 20 feet or less for scaffolds less than three feet wide and every 26 feet or less for scaffolds more than three feet wide;
 - 3.5.2.3. Horizontally – at each end; at intervals not to exceed 30 feet from one end.
- 3.5.3. Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills or other adequate firm foundation and shall include the following;
 - 3.5.3.1. Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement;
 - 3.5.3.2. Unstable objects shall not be used to support working platforms;
 - 3.5.3.3. Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use; and
 - 3.5.3.4. Fork-lifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the fork-lift is not moved horizontally while the platform is occupied.

3.6. Access Requirements

- 3.6.1. Access shall be provided when scaffold platforms are more than 24 inches above or below the point of access. Direct access is acceptable when the scaffold is not more than 14 inches horizontally and not more than 24 inches vertically from the other surfaces. Cross braces shall not be used as a means of access.
 - 3.6.1.1. Type of accesses which are permitted:
 - 3.6.1.1.1. Portable ladders tied off to the structure;
 - 3.6.1.1.2. Hook-on ladders;
 - 3.6.1.1.3. Attachable ladders;
 - 3.6.1.1.4. Stairways;

- 3.6.1.1.5. Stair towers;
 - 3.6.1.1.6. Ramps and walkways; and
 - 3.6.1.1.7. Integral prefabricated frames
- 3.6.2. When erecting or dismantling supported scaffolds, a safe means of access shall be provided when a competent person has determined the feasibility and analyzed the site conditions.

3.7. Fall Protection and Guardrails

3.7.1. Fall Protection

Personal fall arrest systems include harnesses, components of the harness/belt such as Dee-rings, snap hooks, lifelines, and anchorage point. Employees working on scaffolds ten (10) feet or more above ground/floor level shall use fall protection in accordance with IU's Fall Protection Program. See Appendix C for types of fall protection for specific scaffolds.

3.7.2. Guardrails

- 3.7.2.1. All scaffolds more than six feet above the lower level shall protect employees with guardrails on each open side of the scaffold. Guardrails shall be installed along the open sides and ends before releasing the scaffold for use by the employees, other than erection or dismantling crews; and
- 3.7.2.2. Materials such as steel or plastic banding shall not be used for top rails or midrails.

3.7.3. Guardrails are not required when:

- 3.7.3.1. The front end of all platforms are less than 14 inches from the face of the work.
- 3.7.3.2. When employees are plastering and lathing 18 inches or less from the front edge.

3.8. Falling Objects

To protect employees from falling hand tools, debris, and other small objects, install toe boards, screens, guardrail systems, debris nets, catch platforms, canopy structures, or barricades. If there is a risk of falling objects or over-head hazard, a hard hat must be worn.

4. TRAINING & RECORDKEEPING

4.1. *Employees Performing Work on Scaffolding*

All employees who perform work on a scaffold shall be trained by a person qualified to recognize the hazards associated with the type of scaffold being used and the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:

- 4.1.1. The nature of electrical hazards, fall hazards, and falling object hazards in the work area;
- 4.1.2. The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection system and falling object protection system being used;
- 4.1.3. The proper use of the scaffold;
- 4.1.4. The proper handling of materials on the scaffold; and
- 4.1.5. The maximum intended load and the load-carrying capacities of the scaffolds used.

- 4.2. Employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold shall be trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable;
 - 4.2.1. The nature of scaffold hazards;
 - 4.2.2. The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question; and
 - 4.2.3. The design criteria, maximum intended load-carrying capacity and intended use of the scaffold.

- 4.3. Retraining
Retraining is required in at least the following situations;
 - 4.3.1. Where changes at the worksite present a hazard about which an employee has not been previously trained; or
 - 4.3.2. Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
 - 4.3.3. Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

5. REFERENCES

- [Occupational Health and Safety Administration's \(OSHA's\) final rule – 29 CFR 1926 Subpart L,](#)
- [29 CFR 1926.451 "General Requirements for Scaffolds"](#)
- [29 CFR 1926.452 "Additional Requirements Applicable to Specific Types of Scaffolds"](#)
- [29 CFR 1926.454 "Training Requirements"](#)
- [29 CFR 1910.28 "General Requirements for Scaffolding"](#)

6. REVISIONS

New Document – October 28, 2014

APPENDIX A – GLOSSARY

Access: The point at which a person can get to and exit a scaffold.

Aerial Device: Any vehicle mounted, telescoping or articulating, or both, used to position personnel (workers).

Base Plates: A component of a scaffold located on the foot of a pole or frame to assist in stabilizing the scaffold.

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

Competent Person: One who is capable of identifying existing and predictable hazards or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Galvanic Action: A reaction which takes place that weakens the strength of metals when two incompatible metals are placed together.

Guardrails: A vertical barrier, consisting of top rails, mid rails, and posts, erected to prevent employees from falling off of a scaffold platform or walkway to lower levels.

Guying: A rope, chain or rod attached to something as a brace or guide.

Lanyard: A rope used for fastening.

Personal Fall Arrest System: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, or body harness and may include a lanyard, deceleration device, lifeline or suitable combinations of these.

Platforms: A work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Professional Engineer: A person who holds a degree from a university or a certification from an association as an engineer.

Qualified Person: One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, work or project.

Rated Load: The manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

Scaffolds: Any temporary elevated platform (supported) and its supporting structure (including points of anchorage), used for supporting employees or material or both.

Screw Jacks: A component of the scaffold that is attached to the frame and the base plate and is used to assist in leveling the scaffold.

Sill: A horizontal piece that forms the lowest member or one of the lowest members of a framework or supporting structure.

Tying: To fasten or attach.

APPENDIX B – CLEARNACE BETWEEN SCAFFOLD AND POWERLINES

Insulated Lines Voltage	Minimum Distance	Alternatives
Less than 300 volts	3 feet	
300 to 50 kv	10 feet	
More than 50 kv	10 feet plus 0.4 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet
Uninsulated Lines Voltage	Minimum Distance	Minimum Distance
Less than 50 kv	10 feet	
More than 50 kv	10 feet plus 0.4 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet

APPENDIX C –SCAFFOLDS AND REQUIRED FALL PROTECTION

Types of Scaffold	Fall Protection Required
Crawling board	Personal fall arrest system, or a guardrail system, or by a ¾ inch diameter grabline or equivalent handhold securely fastened beside each crawling board
Self-contained scaffold	A guardrail system
Supported scaffolds	Personal fall arrest system or guardrail system
All other scaffolds not specific above	Personal fall arrest system or guardrail systems that meet the required criteria as specified in 1926.451(g)(4) .

APPENDIX D-1: REQUIREMENTS FOR FABRICATED FRAME SCAFFOLDS

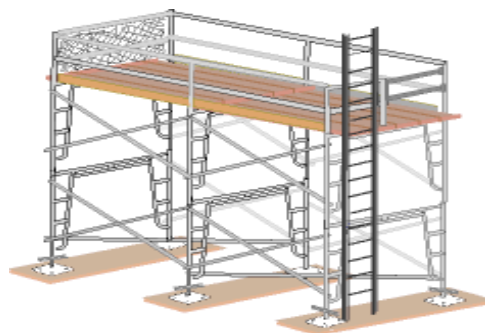
The structural members of fabricated frame scaffolds such as the legs, poles, posts, frames and uprights shall be plumb and braced to prevent swaying and displacement.

All fabricated frame scaffolds with a height to base width greater than 4 to 1 shall be restrained by guying, tying or bracing. Guys, ties or braces shall be placed:

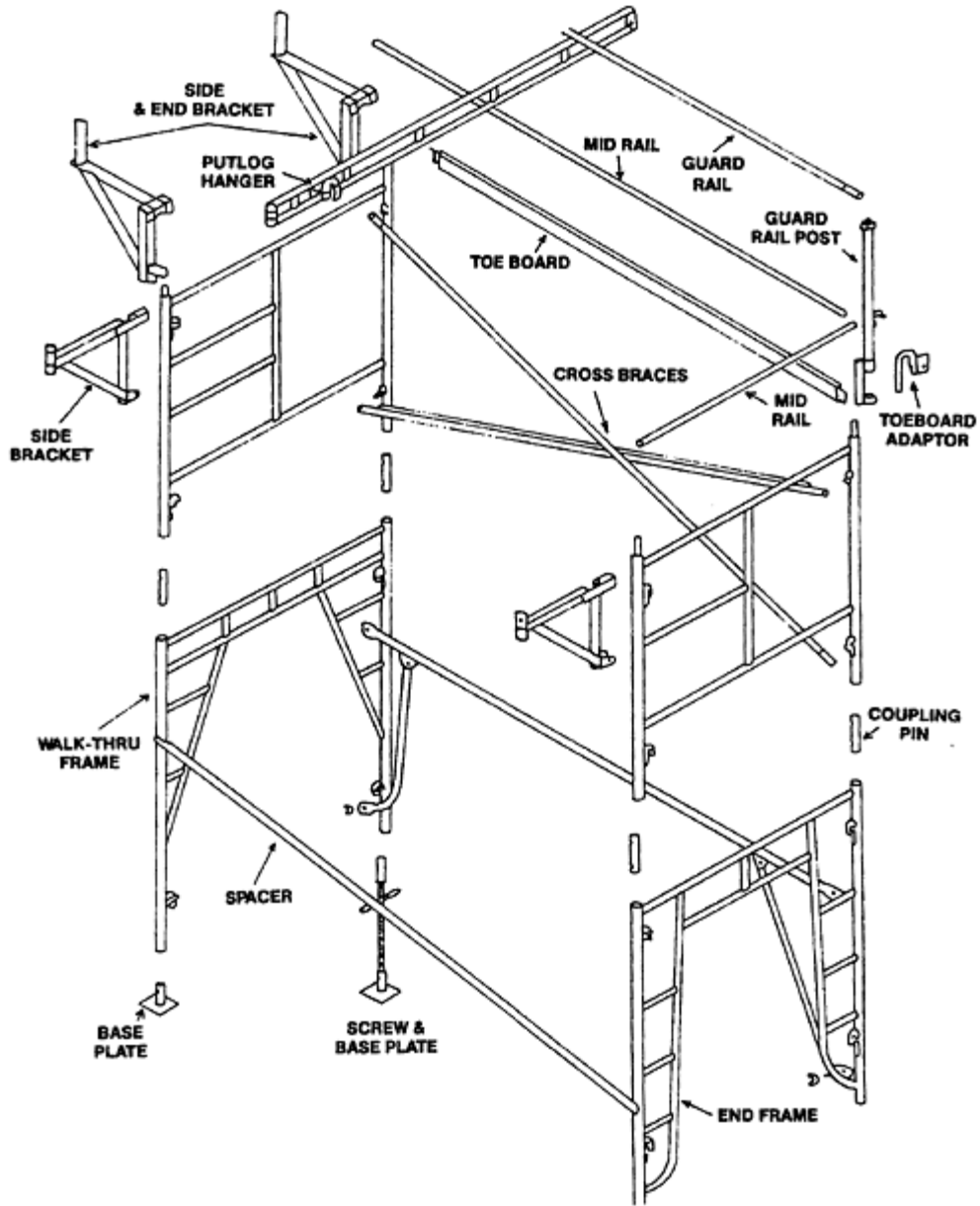
- At the closest horizontal member to the 4 to 1 height and repeat vertically with the top restraint no further than the 4 to 1 height from the top;
- Vertically every 20 feet or less for scaffolds less than three feet wide and every 26 feet or less for scaffolds more than three feet wide; and
- Horizontally at end, at intervals not to exceed 30 feet from one end.

Specific Requirements

- When moving platforms to the next level, the existing platform shall be left undisturbed until the new frames have been set in place and braced;
- To secure vertical members together laterally, frames and panels shall be braced by cross, horizontal, diagonal braces or a combination thereof. The cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, level and square;
- All brace connections shall be secured;
- Frames and panels shall be joined together vertically by coupling or stacking pins or equivalent means;
- Where uplift can occur which would displace scaffold end frames or panels, the frames or panels shall be locked together vertically by pins or equivalent means;
- Brackets used to support cantilevered loads shall:
 - Be seated with side-brackets parallel to the frames and end-brackets at 90 degrees to the frames;
 - Not be bent or twisted from these positions; and
 - Be used only 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 those other loads being placed on the bracket-supported section of the scaffold.



FABRICATED FRAME SCAFFOLD

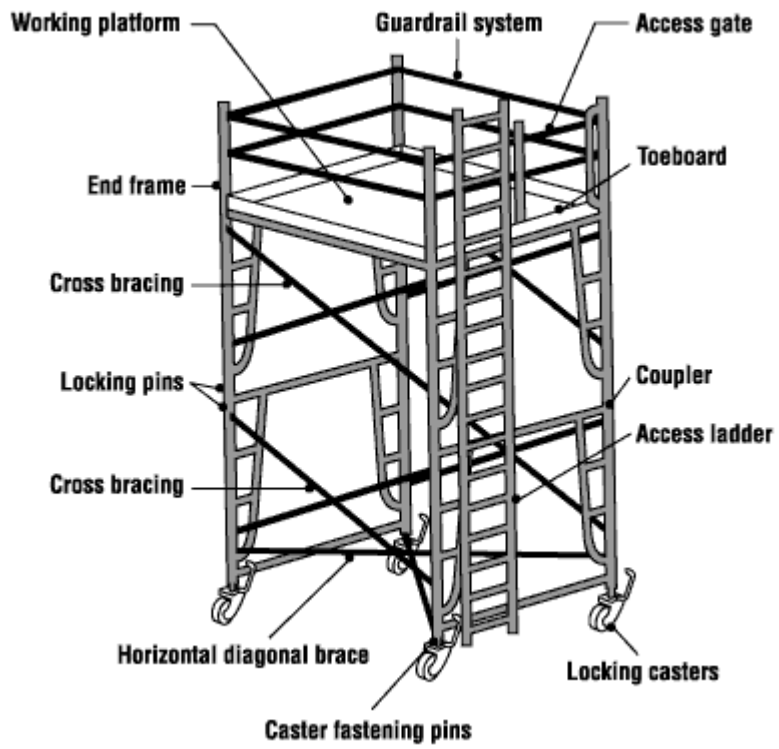


APPENDIX D-2: REQUIREMENTS FOR MOBILE SCAFFOLDS

Specific Requirements

The requirements for mobile scaffolds are as follows:

- A competent person shall evaluate all direct connections prior to use to confirm that the supporting surfaces are able to support the imposed load;
- Scaffolds shall be braced by cross, horizontal, diagonal braces, or combination thereof, to prevent racking or collapse of the scaffold and to secure vertical members together laterally so as to automatically square and align the vertical members. All brace connections shall be secured;
- Scaffolds constructed of tube and coupler components shall also comply with the specific requirements for tube and coupler scaffolding;
- Scaffolds constructed of fabricated frame components shall also comply with the specific requirements for fabricated frame scaffolds;
- Scaffold casters and wheels shall be locked with a positive wheel and/or wheel and swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner;
- Manual force used to move the scaffold shall be applied as close to the base as practicable, but not more than five feet above the supporting surface;
- Power systems used to propel mobile scaffolds shall be designed for such use. Forklifts, trucks, similar motor vehicles or add-on motors shall not be used to propel scaffolds, unless the scaffold is designed for such propulsion systems;
- Scaffolds shall be stabilized to prevent tipping during no movement; employees shall not be allowed to ride on scaffolds unless the following conditions exist:
 - The surface on which the scaffold is being moved is within three degrees of level, and free of pits, holes and obstructions;
 - The height to base width ratio of the scaffold during movement is 2 to 1 or less, unless the scaffold is designed and constructed to meet or exceed the nationally recognized stability test requirements;
 - Outrigger frames, when used, are installed on both sides of the scaffold;
 - When power systems are used, the propelling force is applied directly to the wheels and does not produce a speed in excess of one foot per second; and
 - No employee is on any part of the scaffold which extends outward beyond the wheels, casters, or other supports;
- Platforms shall extend outward beyond the base supports of the scaffold unless outrigger frames or equivalent devices are used to ensure stability;
- Where leveling of the scaffold is necessary, screw jacks or equivalent means shall be used; and
- Caster and wheel stems shall be pinned or otherwise secured in scaffold legs or adjustment screws.



APPENDIX D-3: REQUIREMENTS FOR CRAWLING BOARDS

Specific Requirements

The requirements for crawling boards are as follows:

- Boards shall extend from the roof peak to the eaves when used in connection with roof construction, repair, or maintenance; and
- Boards shall be secured to the roof by ridge hooks or by means that meet equivalent criteria (e.g., strength and durability).

