

SCAFFOLDING SAFETY

Scaffold Accidents

Over a seven-year period, OSHA statistics report that about 28% of the scaffold accidents that occur are the result of construction deficiencies. These deficiencies include using substandard components, omitting essential components, or failing to complete the assembly.

Of the fatalities that occurred, 23% occurred as a result of construction deficiencies. About 14% occurred while climbing. Another 8% occurred while assembling/disassembling the scaffolding. About 10% of the fatalities occurred where the result of the scaffolding structurally failing. Another 18% of the fatalities happened as a result of electrocutions. Approximately 10% of the fatalities were from falling objects, while 10% happened because of falls while working on the platform.

General Scaffold Components

All metal frame scaffolds share common components. Platforms, base supports, side brackets, and support trusses.

General

Metal frame scaffolds must be designed at four times their rated carrying capacity. Trained personnel must erect all supported scaffolds. All scaffolds greater than 125 feet in height must be designed by a registered professional engineer.

Platforms

Each platform must be fully planked or decked. Platforms should be a minimum of 18" wide. Each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch (2.5 cm) wide, except where the employer can demonstrate that a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform).

Platform Loading:

Distribute the weight evenly. Place the heaviest load over vertical members. Scaffold platforms cannot deflect greater than 1/60 of the span distance when loaded.

Platform Overhang:

If a platform is less than 10 feet long, the maximum overhang is restricted to 12". On platforms longer than 10 feet, the maximum overhang is 18".

Planks:

Scaffold planks must be made from scaffold-grade lumber or be laminated planks. Do not use planks that are cut, split, chemically damaged, or painted. Plank overlap must be by 12" unless restrained. Ends should always be cleated or restrained. If the end overhang is less than 6", the ends **must** be cleated or

restrained. Planks must be a minimum of 2" by 10" (nominal). A minimum of two planks no further than 1" apart must be used.

Fabricated Wooden or Metal Decks:

Load bearing limits and dimensions are determined by the scaffold deck manufacturer. The deck must be marked with its carrying capacity. Decks are not to be dropped from scaffolds. Never use bent or damaged decks. Standard lengths are 6' and 10'. No overlap is required.

Base Support:

A firm, level foundation is required for all supported scaffolds. Scaffold base plates or casters are to be used on **all** scaffold legs. Plates and casters must be pinned or secured to the frame at all times.

Mud Sills:

Mud sills are platforms designed to distribute scaffold weight. The size of mud sills used is based on ground support conditions and maximum anticipated loads on the scaffold legs. Scaffold planks are sometimes used as mud sills. Do not use working planks for mud sills since this practice could damage planks.

Screw Jacks:

Screw jacks are designed for leveling the scaffold. The recommended maximum extension for fixed scaffolds is 18", while 12" is the maximum for mobile scaffolds.

Side Brackets:

Can be used with all metal frame scaffolds. Manufacturers determine the requirements. Side brackets are designed only to support personnel unless engineered otherwise.

Truss Bearers:

These are used when it is necessary to span greater than standard distances such as doorways. The manufacturer set limits to the length and capacity. Truss bearers may require additional bracing on the scaffold system. Follow the manufacturer's requirements when truss bearers are used.

Ties:

Ties provide protection against toppling. Ties are secured at the junction of the vertical and horizontal scaffold members. They must be of rigid construction. A positive anchor is required. Guys, ties, and braces must be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet or less thereafter for scaffolds 3 feet wide or less, and every 26 feet or less thereafter for scaffolds greater than 3 feet wide. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (measured from one end [not both] towards the other).

Additional ties may be required under special circumstances, such as loads not centered, winds, hoisting, or on covered scaffolds. Guys are required if the scaffolding is free standing and are greater than four

times the minimum base width in height. Guys must be a minimum of 3/8" wire rope and should be tied at a 45° angle to the scaffold.

Supported Metal Scaffolds

Welded Frame Scaffold:

These consist of end frames and braces. All components must be inspected for damage/defects prior to being used. When erecting scaffolding, start at the highest point of the run and work downhill. Cross braces will automatically square the scaffold frames. Ensure that the scaffold is level, square, and plumb. Use pin connections on all frames to prevent separations of frames. Ladders provide access to the scaffold. Ladders are not to be used on scaffolding unless it is secured top and bottom, the scaffold is secured from any movement and the platform is stabilized to prevent deflection.

Mobile Scaffold:

Mobile scaffolds have restricted reach unless a guy wire secures them. They are more susceptible to overturning and require a smooth, level working surface. Additionally, they are the most frequent type of scaffold involved in power line accidents. A complete guardrail system must be used at elevations above 10 feet and shall be used at all working levels. Scaffold should be moved when unoccupied and only by pushing from the base. Wheel brakes must be set when scaffold is in use. Base dimensions may be extended with outriggers.

Swing Stage Scaffold:

Platforms shall not be less than 20". The platform shall be securely fashioned to the hangers. Hangers shall be capable of sustaining four times the maximum rated load and shall be designed with support for guardrail. Roof irons or hooks shall be of mild steel or equivalent material. Tiebacks of 3/4" manila rope or equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building and secured to a structurally sound portion of the building. All scaffold components must be inspected before each use and periodically while in use. On suspension scaffolds designed for working load of 500 pounds, no more than two employees shall be permitted to work at one time. On suspended scaffolds with a working load of 750 pounds, no more than three employees shall be permitted to work at one time. Each employee shall be protected by an approved safetyline attached to a safety harness. The safetyline shall be securely attached to substantial members of the structure independent of the scaffold. A minimum of slack in the lifeline must be maintained.

Guardrail System/Fall Protection

Fall protection is required on all scaffolds where the working height is above 10 feet. A guardrail is required above 10 feet on all scaffolds if fall arrest system is not used. Guardrails must be able to withstand 200 pounds of force. Top rails shall be about 42" in height. Mid rails and toe boards are required. Toe boards must be at least 3 1/2" in height. Cross braces may be used as mid rails if the cross height is 20" to 30" above the platform. Interior guardrails are not required when the working face is less than 14" from the platform. Guardrails must be installed on all open ends and sides of platforms more than 10 feet in height. Upright supports must be no more than 8 feet apart.

Scaffold Access

All metal frame scaffolds must have a means of access. This access can be gained from attached or portable ladders, stairways, or the adjacent structures. Ladders must extend 3 feet above the working

surface. Gates or removable guardrails or safety chains must be used at the ladder landing. Employees shall not work on scaffolds during storms or high winds.

Scaffold Erection

Scaffold shall only be erected, moved, dismantled, or altered under the supervision of competent persons. A fall protection plan must exist when erecting scaffolding.

Date