

# Fire Engineering®

## Construction Concerns: Improvised Scaffolds

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For [www.fireengineering.com](http://www.fireengineering.com)

Photos by author.

Most buildings require the use of temporary structures for worker access during their construction and remodeling. These are called “scaffolds” and are covered in detail in the Occupational Safety and Health Administration (OSHA) regulations in 29 CFR 1926.450 through 454 and their appendices (available online at [www.osha.gov](http://www.osha.gov)).

Photo 1 shows a scaffold that has been constructed to the scaffold manufacturer’s and OSHA’s requirements.



(1)

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Although this scaffold is not yet complete, it has been adjusted to plumb and leveled by screw jacks on wood mudsills on compacted soil. Each deck level is fully planked. Each deck level has a guardrail with top-rail, mid-rail, and toe-board. Before it is released for use to the insulators and bricklayers, the scaffold will be tied to the wall behind it; extended to its full height; and inspected again for plumb and level, missing components, and any other defects and hazards.

Although scaffolds are usually constructed of prefabricated steel frames, connectors, and braces, these parts are not always available on the job site in sufficient quantities, which leads to improvised scaffolds rather than the acquisition of the needed parts. This improvisation leads to unstable structures and can lead to worker injury and fatality as well as being hazardous to emergency responders who may be called to an incident involving these substandard structures.

A common scaffold defect is inadequate or unstable foundations.

Photo 2 shows the foundation for a scaffold's pair of legs. The mud pads are set on uneven ground and have voids beneath them.



(2)



The screw jacks are at maximum extension, and one has been supplemented by stacked pieces of scrap lumber. This is a hazardous and unstable condition; the mud pads can collapse into the voids beneath, and the stacked pieces of lumber can shift beneath the scaffold leg. This area should have been leveled before the scaffold was set and the ground level adjusted so that the stacked lumber and screw jacks being at maximum extension would have been unnecessary.

Photo 3 shows a scaffold that was set before the ground was ready. The scaffold has been set on the edge of an excavation, which could cave in under the weight of the scaffold, building materials, and workers.



(3)

The scaffold leg in the foreground is set on a mud pad that is already slipping into the excavation, making the scaffold unstable. The scaffold leg beyond it is set on a mud sill that is cantilevered over the edge of the excavation, and that depends on the other leg on the mud sill as a counterweight. This scaffold should not have been set until the excavation was backfilled and leveled with compacted soil.

A second common defect is the use of defective components. Photo 4 shows two aluminum planks that were in use as part of a “ladder-jack” scaffold [OSHA’s 29 CFR 1926.452 (k)]. The plank on the left is intact. The plank on the right is missing one-third of its walking and working surface, has less strength than its design, and provides a trip hazard for anyone working from it.



(4)

A third common defect is the use of ladders to supplement the height of a scaffold. Photo 5 shows a stepladder in use on top of a scaffold. The scaffold itself is missing its guardrail and has only a single plank connecting it to the adjacent parts of the scaffold (rather than a full plank deck). In addition, the stepladder was in use leaning against the wall, a position for which it was not designed; the stepladder in this position forces the scaffold away from the building and can lead to a fall and serious injury by the worker as well as the collapse of the scaffold.



(5)

A fourth common defect is the use of improvised equipment and materials to make a scaffold. Photo 6 shows a scaffold built of aluminum plank supported by stepladders leaning against the wall.





(6)

According to the scaffold standards, a scaffold walkway must be at least two planks wide and be supported by either scaffold frames or a job-built scaffold that has been designed according to OSHA's scaffold standard and its appendices. These standards do not permit the following:

- The use of a single plank supported by a stepladder.
- The use of a scaffold supported by a stepladder.
- The bridging of one plank to another on a ladder-supported scaffold.

The ladder standards do not permit a stepladder to be used other than in an open position with its spreaders locked.

If fire or emergency medical services (EMS) respond to an incident and find the sorts of scaffold deficiencies shown in Photos 2-6, they must keep in mind that these scaffolds are not stable and may have contributed to the injury or other problem they have been called to address. If an EMS patient is still on a scaffold with these kinds of deficiencies, we are well advised to support ourselves and the patient by another means rather than adding the weight of our response personnel to an already deficient scaffold.

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