Scaffolding

The University of Tennessee
Office of Environmental Health & Safety

What is a Scaffold?

An elevated, temporary work platform

Three Basic Types:

- ✓Supported
- ✓Suspended
- ✓Aerial Lifts

Do employees working on scaffolds need to be trained?

Hazards

- ✓Falls from elevation
- ✓Struck by
- ✓Electrocution
- ✓Scaffold collapse
- ✓Bad planking

Fall Hazards

Falls may occur:

- ✓While climbing
- ✓Working
- ✓Equipment failure

Protecting Workers from Falls

- ✓Guardrails, and/or
- ✓Personal Fall Arrest Systems (PFAS)

Guardrails

- ✓Front edge
- ✓Top rails
- ✓Midrails
- ✓Toeboards

Personal Fall Arrest Systems (PFAS)

- ✓Anchorage
- ✓Lifeline
- ✓Body harness

Must be trained to properly use PFAS

Fall Protection Requirements

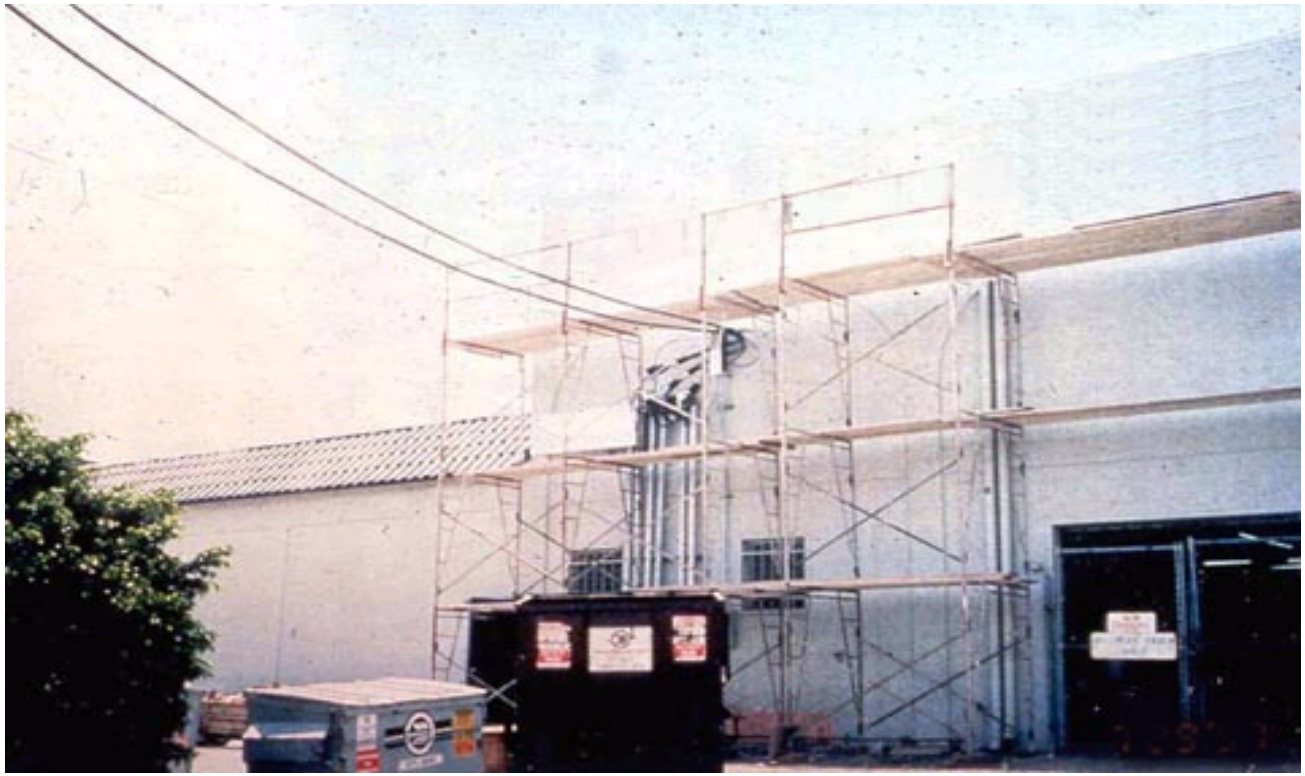
The ends of this scaffold are not properly guarded

- ✓PFAS instead of guardrails
- ✓PFAS & guardrails
- ✓PFAS on erectors and dismantlers

Falling Object Protection

- ✓Hardhats
- ✓Barricade
- ✓Panels or screens
- ✓Canopy or net

Overhead Power Lines



Ten foot rule recommended

Scaffold Support Example #1

Inadequate support – in danger of collapse?

Scaffold Support Example #2

Good support

Essential Elements of Safe Scaffold Construction

- ✓Appropriate construction
- ✓Proper access
- ✓Competent person

Scaffold Platform Construction

Platforms must:

- ✓Fully planked
- ✓Able to support
- ✓18 inches wide

This is not a properly constructed scaffold

Scaffold Platform Construction

- ✓Gaps
- ✓Support
- ✓Overlap

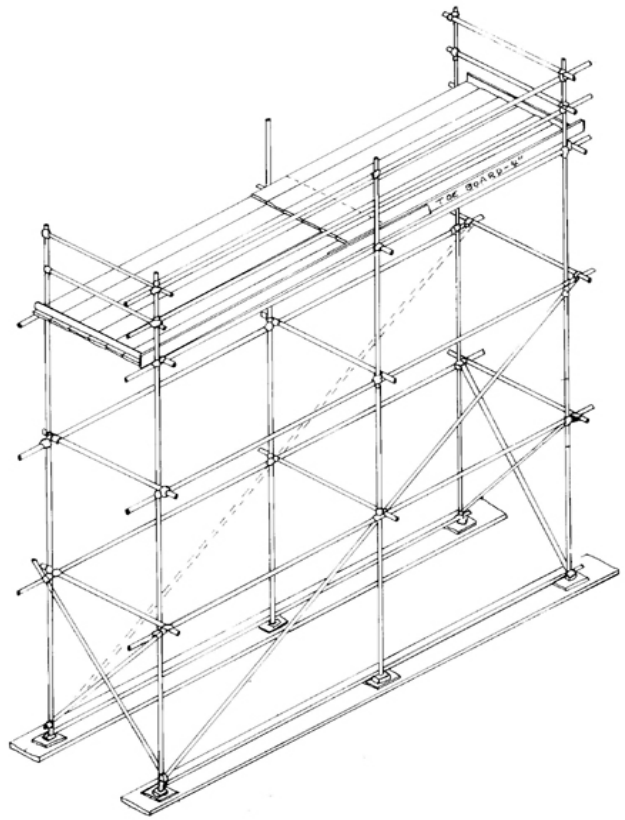
Planks not properly overlapped

Scaffold Platform Construction

- ✓No paint
- ✓Graded wood
- ✓Fully planked
- ✓Matching components
- ✓Stability
- ✓Locking

Scaffold Height

No more than four times its minimum base dimension



20’

5’

Final Rule
Summary and Explanation

Q: When is a competent person required for scaffolding?

Answer:

To - select and direct employees who erect, dismantle, move or alter scaffolds.

To – determine if it is safe for employees to work on or from a scaffold during storms or high winds and to ensure that a personal fall arrest system or wind screens protect these employees.

To – train employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds to recognize associated work hazards.

To – inspect scaffolds and scaffold components for visible defects before each work shift and after any occurrence which could effect the structural integrity of the scaffold.

The competent person must be capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Final Rule
Summary and Explanation

Q: When is a qualified person required for scaffolding?

Answer:

Same as the qualified person with the following exceptions:

To - design and load scaffold in accordance with that design.

To – design rigging, and platforms for suspension scaffolds and make swaged attachments or spliced eyes on wire suspension ropes.

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

Final Rule
Summary and Explanation

Q: When is an engineer required?

Answer:

To design – the direct connections of masons' multi-point adjustable scaffolds; scaffolds that are to be moved when employees are on them; pole scaffolds over 60 feet; tube and coupler over 125 feet; frame scaffolds over 125 feet and to design brackets on fabricated frame scaffolds used to support cantilevered loads in addition to workers.

The standard requires a registered professional engineer to perform these duties.

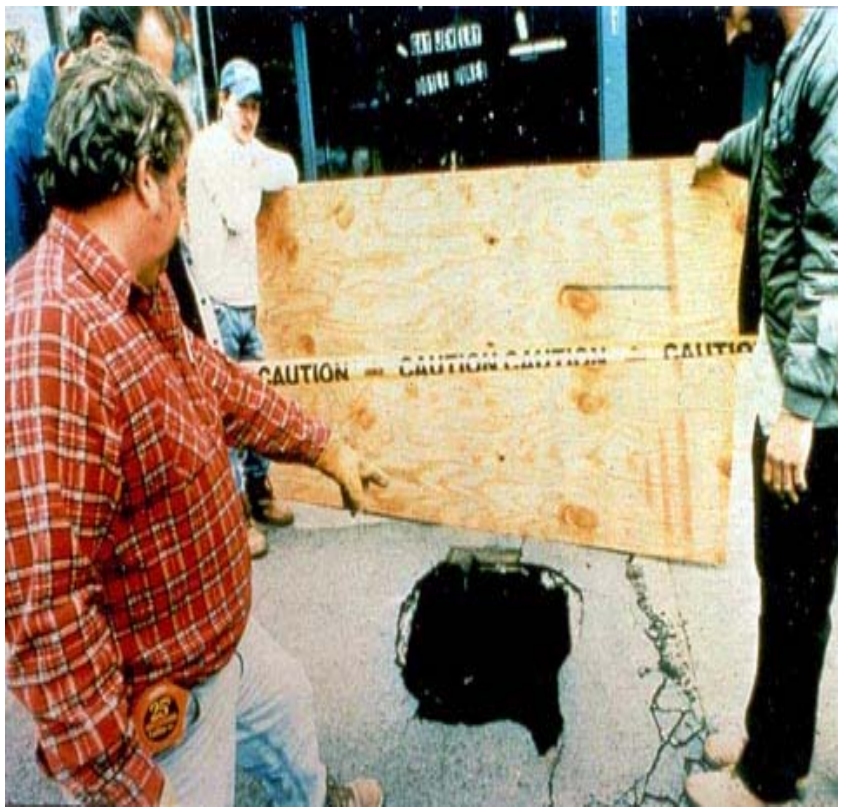
Platform Ends

Unless cleated or restrained by hooks, must extend over support by at least 6 inches

Supported Scaffolds

This support is not adequate!

- ✓Supports
- ✓Restraints
- ✓Foundation



This is a great example of what can happen when construction workers fail to investigate the site where their scaffold is being erected, and base plates are not used. The scaffold in question (now taken down) punched a hole through the downtown sidewalk. The workers failed to realize that the sidewalk was only made from blacktop, and it had a basement under it. EXAMPLE OF POINT LOADING!!

Proper Scaffold Access

Permitted types of access:

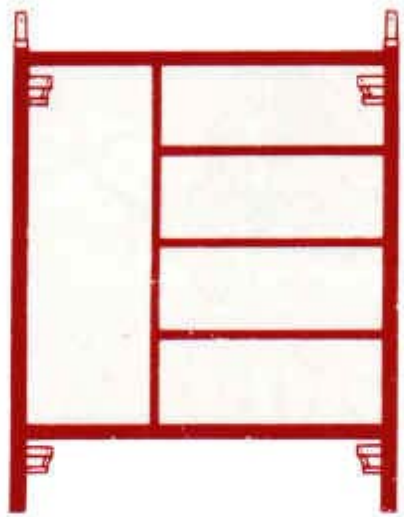
- ✓Ladders
- ✓Stair towers
- ✓Ramps & walkways

May use building stairs and come out window

Scaffold Access

Do not access by crossbraces

- ✓Crossbraces
- ✓Other scaffold
- ✓Ladders
- ✓End Frames



End Frame

Suspension Scaffolds

- ✓Platform suspension
- ✓Recognize hazards
- ✓Prevent swaying
- ✓Support
- ✓Competent person
- ✓PFAS

Moving Scaffolds

Employees can't be on a moving scaffold unless:

- ✓Level surface
- ✓2 to 1 ration
- ✓Outriggers
- ✓Competent person

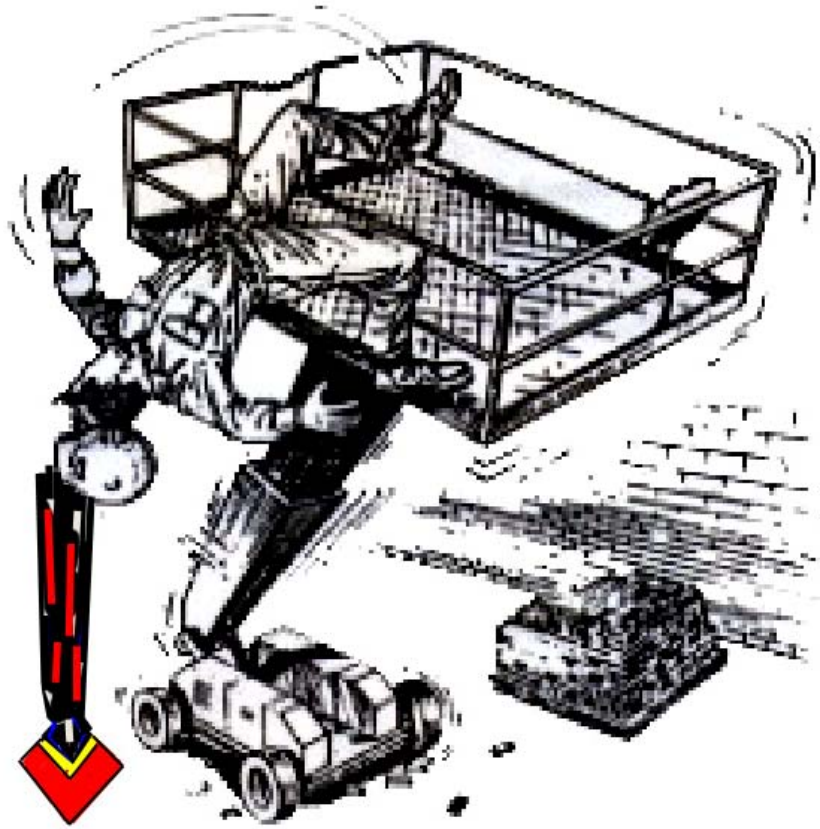
Employees can't be on scaffold part beyond the wheels

Fatal Fact – Moving a Lift

Employee was operating an aerial lift, with an extendable boom rotating work platform.

The boom was fully extended and the machine apparently ran over some bricks, causing the boom to flex or spring, throwing the employee from the basket.

The employee fell (head first) 37 feet to a concrete surface below.



Don’t use Shore or Lean-to Scaffolds

Shore scaffold supported scaffold which is placed against a building or structure and held in place with props

Lean-to scaffold supported scaffold which is kept erect by tilting it toward and resting it against a building or structure

Using Scaffolds

A covered scaffold has special wind load considerations

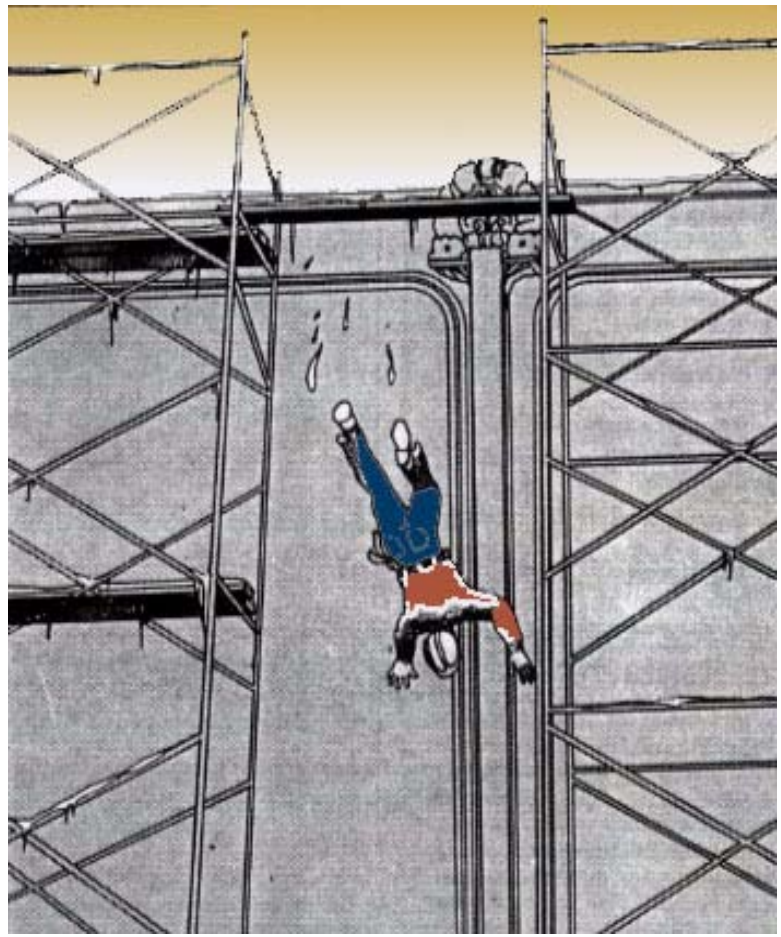
- ✓Snow or Ice
- ✓Storms or High Winds
- ✓Tag lines
- ✓Protect suspension ropes

Fatal Fact – Ice & No Guardrails

A laborer was working on the third level of a tubular welded frame scaffold which was covered with ice and snow

The scaffold was not fully decked, there was no guardrail and no access ladder

The worker slipped and fell head first 20 feet to the pavement below



Overhead Bricklaying

from Supported Scaffolds

A guardrail or personal fall arrest system is required on all sides except the side where the work is being done

Competent Person

- ✓Identify hazards
- ✓Corrective action
- ✓Storm / High Winds
- ✓Trainer
- ✓Crew selection

Scaffold Inspection

- ✓**A competent person will inspect scaffolds for visible defects before each shift and after any alterations**
- ✓**Defective parts must be immediately repaired.**

Deformed bearer

Scaffold Erection

Erected only under the supervision of a:

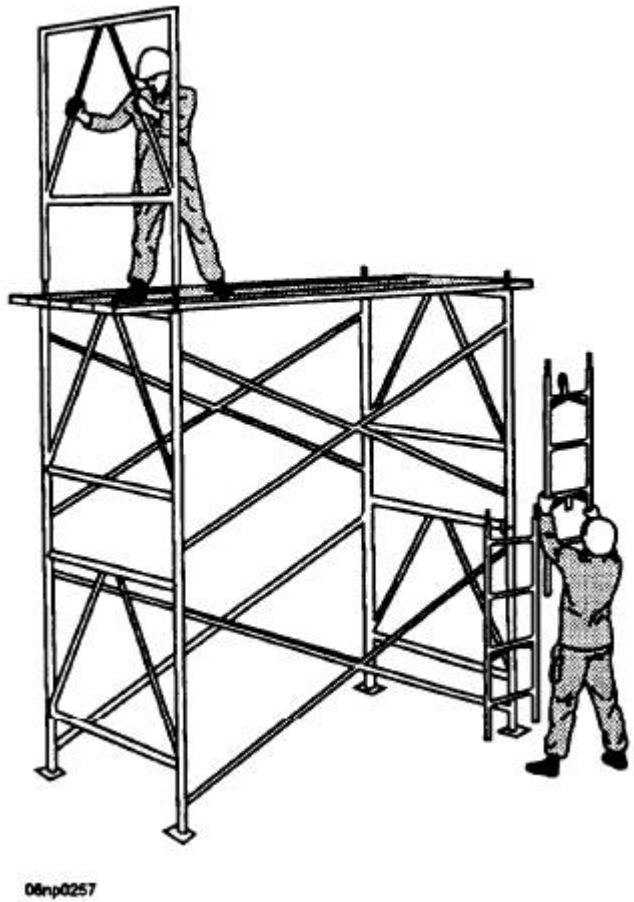
A scaffold at a church being constructed in Tennessee. Someone must have been watching over these folks, because they finished the job without the scaffold falling down

Training Requirements

- ✓Electrical presence
- ✓Falling objects
- ✓Fall protection
- ✓Proper use
- ✓Load capacities
- ✓Retrain

Training Erectors

- ✓Recognize hazards
- ✓Correct procedures



Avoid the Main Hazards of Scaffolds

- ✓Falls from elevation
- ✓Scaffold collapse
- ✓Bad Planking
- ✓Getting struck by falling tools or debris
- ✓Electrocution

Summary

Remember to:

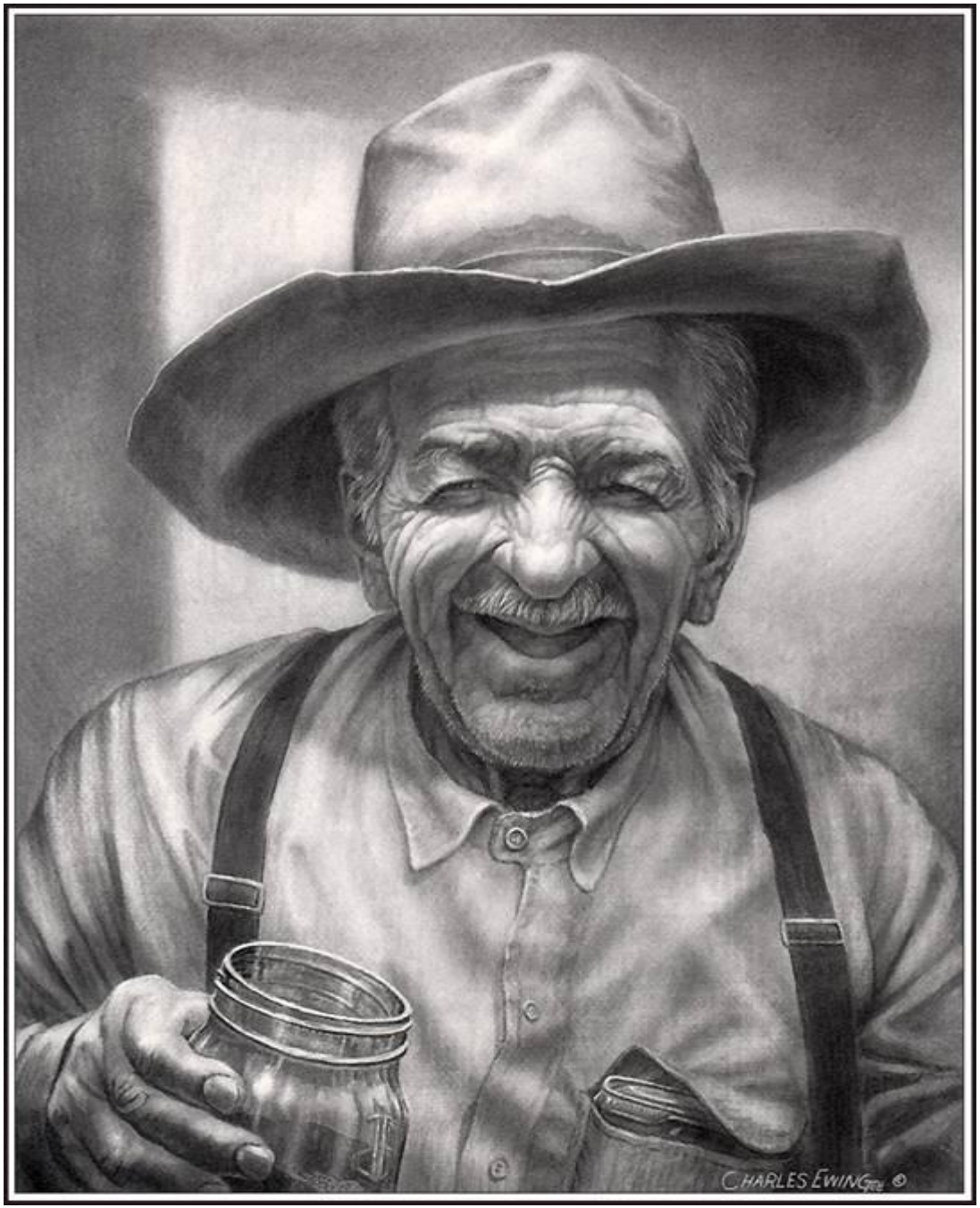
Use appropriate scaffold construction methods

- ✓Erect, move, or alter scaffold properly
- ✓Protect from falling objects or tools

Ensure stable access

Use a competent person

- ✓Train on scaffold construction and the hazards involved with scaffolds
- ✓Inspect scaffold before each shift and after alteration
- ✓Determine fall protection requirements



That's all folks