

Scaffolds in Construction

Session Objectives

You will be able to:

- Understand the nature of scaffold hazards
- Identify major types of scaffolds and their use
- Erect, move, operate, inspect, and maintain a scaffold
- Implement safe work practices, use fall protection, and protect yourself from falling objects

Scaffolding Accidents

- 9% of construction-related fatalities each year are related to scaffolding
- There are almost 10,000 scaffold-injuries each year
- Loose planks are common causes of accidents
- About 1/3 of scaffolding involved injuries did not have proper guardrails
- About 25% of workers are not properly trained



Common Hazards of Scaffold Work

ELECTRICAL CONTACT WITH SCAFFOLDS

- Stay away from electrical wires
- Keep metal objects away from these wires

SLIPS, TRIPS, AND FALLS

- Most common hazards of scaffolds

FALLING OBJECTS

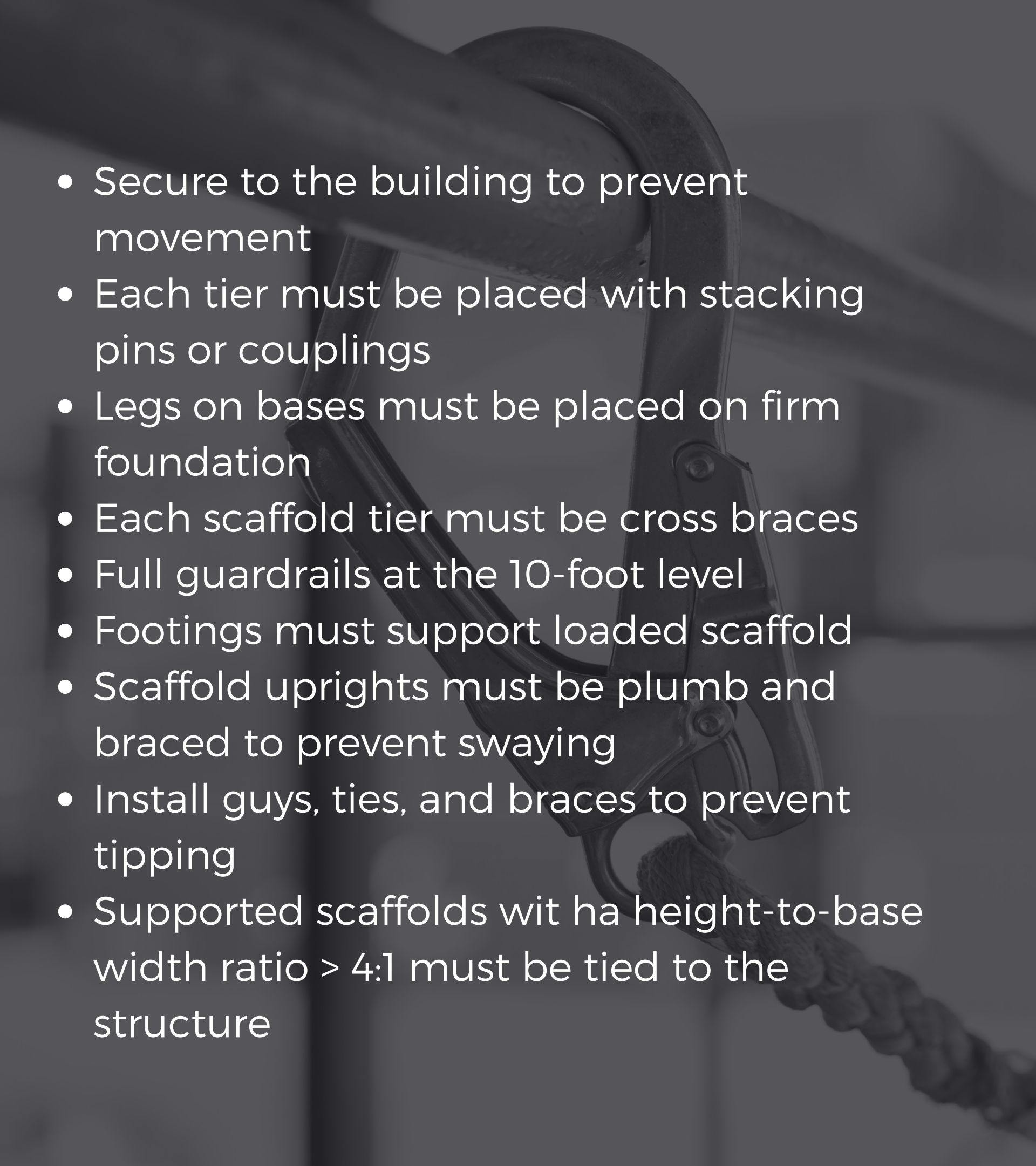
- Tools and equipment

WEATHER-RELATED HAZARDS SUCH AS RAIN, ICE, SNOW

- Can cause slippery surfaces

Types of Scaffolds

- Most Common
 - Welding frame
 - Mobile (rolling)
 - Two-point suspension (swing stage)
- Less Common
 - Boatswains chairs and floats
 - Tube and coupler
 - Interior hung (needle beam)
 - Ladder staging

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- Secure to the building to prevent movement
 - Each tier must be placed with stacking pins or couplings
 - Legs on bases must be placed on firm foundation
 - Each scaffold tier must be cross braced
 - Full guardrails at the 10-foot level
 - Footings must support loaded scaffold
 - Scaffold uprights must be plumb and braced to prevent swaying
 - Install guys, ties, and braces to prevent tipping
 - Supported scaffolds with a height-to-base width ratio $> 4:1$ must be tied to the structure

Welding Frame and Other Supported Scaffolds

MOBILE (ROLLING) SCAFFOLD

- Height must not exceed 4 times the minimum base dimension
- Must be fully planked, platform secured, and locked in place
- Never ride on a mobile scaffold unless specified conditions exist
- Casters must withstand 4 times the load of the scaffold, with positive locking devices
- Each tier must be fully braced
- The platform must have full guardrails if it is 10 feet above the ground
- Power system's used to move scaffolds must be designed for that purpose
- Platforms must not extend beyond base supports
- Level using screw jacks or equivalent

Suspension Scaffolds



- Each rope must support 6 times max load

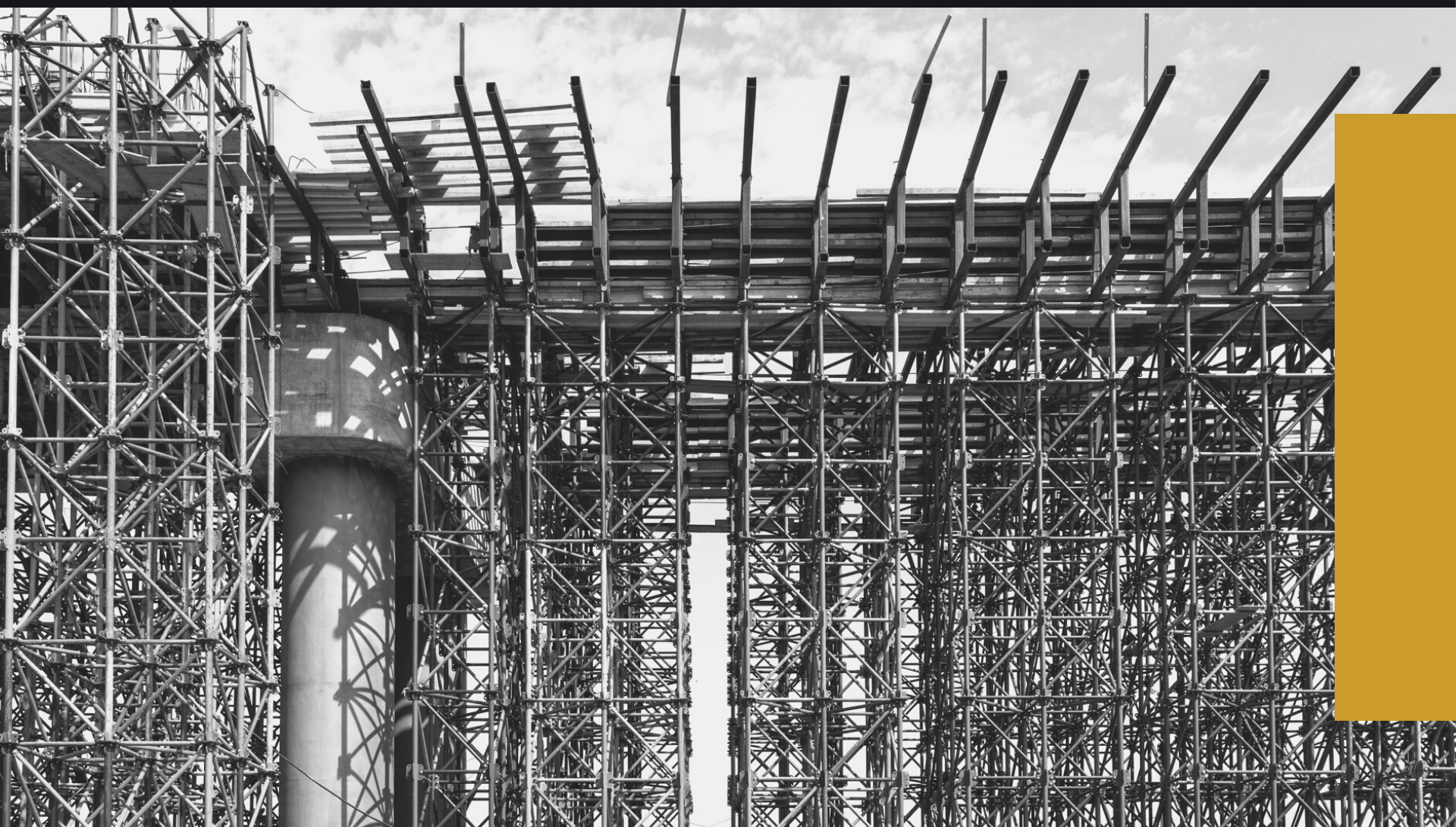


- Wire ropes must be inspected prior to each work shift for:
- Kinks, bends or other physical damage
 - Broken wires in the strands
 - Abrasion, corrosion, and heat damage



- Repaired wire rope cannot be used
- Suspension scaffolds must have emergency or automatic braking devices

Scaffold Capacity



- Each scaffold and component must be designed by a qualified person
- It must support its own weight plus at least 4 times its maximum intended load
 - Includes total weight of all persons, equipment, tools, materials, etc.
- It must be constructed and loaded according to the design criteria

Access To Platforms

- Use a ladder or steps for platforms more than 2 feet above or below point of access
- Climbing cross braces is not a form of access
- Use proper access
 - Hook-on ladders-positioned so they cannot tip over the scaffold
 - Stairways and stair towers-must have slip-resistant steps and platforms; must have railings and landing platforms at each level
 - Inclined ramps and walkways-sloped at ratio of 1 vertical to 3 horizontal; cleats must be fastened to the plank if slope is steeper than 1:8 ratio
 - Ramps and walkways must have guardrail systems if 4 feet or more above a lower level

Platform Construction

- Working platforms must be fully planked between the front uprights and the guardrail supports
- Most platforms must be at least 18" wide
- Must be within 14" from face of work
- Must extend at least 6" over support
- Cantilevered platform ends must be supported or guarded
 - If not supported, the cantilevered portion cannot exceed 12 inches for a platform that is 10 feet long or less and cannot exceed 18 inches for a platform that is more than 10 feet long



Long Platforms

- Abutted platform ends must rest on separate supports
- Common supports may be used for platforms specifically designed for such use
- Planks must be over supports and overlapped at least 12" or secured
- At corners, the overlapped plank that is NOT at a right angle must be laid down first and go UNDER the plank that is at a right angle to the support

Platform Components

- Wood platforms must not be painted-
paint may hide defects in the wood
 - In the event the platform needs to be painted for the purpose of marking or identification, the ends of the platform may be painted
- Components from one manufacturer must not be used with those of another system
- Component must not be modified
- Components of dissimilar metals must not be used together



Guardrail Systems

- Must be installed along open sides and end of platforms
- Must be in place before scaffold is released for use
- Top height of guardrails must be between 38" and 45" (42" standard)
- Top rails must be capable of withstanding 200 pounds of force
- Mid-rails must be installed between top rail and platform
- Screens, mesh, or solid panels may be used
- Mid-rail systems must withstand 150 pounds
- Cross braces may be used provided they do not exceed a 19" opening
- Guardrails may not present a puncture or laceration hazard

Protection From Falling Objects



- Wear hard hats



- Use toe boards
- Use screens or panels when items are stacked



- Canopies, debris nets, or catch platforms may be used
- Barricade areas below to protect from overhead hazard

Scaffold Safe Practices

- Scaffolds must be erected, dismantled, and altered under supervision of a competent person
- Inspect scaffolds before each work shift
 - Only a qualified person may conduct the inspection
- Replace damaged or weakened scaffold components
- Keep scaffolds away from energized power lines
 - Must be at least 3' from a power line of less than 300 volts
 - Must be at least 10' away from a power line of greater 300 volts
- Do not load scaffold beyond their rated capacity
- Do not move scaffolds horizontally while you are on them
- Do not work on scaffold that are covered with snow or ice
- Do not work on scaffolds during storms or high winds
- Debris should not be allowed to accumulate on platform

Ladders on Scaffolds



- **Ladders are prohibited except on large area scaffolds**
- **Ladders must be secured against sideways movement**
- **Platforms must be secured to the scaffold**
- **Ladder legs must be prevented from slipping off platform**
- **You are not permitted to stand on boxes or other items**



Fall Protection

- Required when working 10 feet above a lower level (lower level is considered ground, floors, roofs, pits, tanks, materials, equipment)
- Use approved personal fall arrest system (i.e., boatswain chairs, catenary scaffolds, needle beam scaffolds, ladder jack scaffolds)
- Use guardrail systems
- Suspension scaffolds require both guardrails and personal fall arrest system

PERSONAL FALL ARREST SYSTEM

- Vertical lifelines must be fixed to anchor independent of scaffold
- Vertical lifeline must not be anchored to the same point as suspension ropes
- Horizontal lifelines must be secured to two or more points of scaffold
- Suspension scaffolds must be equipped with additional support lines
- Anchorage must support 5,000 pounds of force

Key Points to Remember



- Inspect the scaffold before each work shift
- Properly secure platforms



- Do not overload scaffolds
- Wear personal fall arrest system



- Understand scaffold hazards and follow accident prevention measures

TAKE THE QUIZ

- <https://forms.office.com/Pages/ResponsePage.aspx?id=RZJ-M6ZIREqmNwvW9nbIKxyzzaSUgJJFgf5zZdrqY-IUQzVCM1VSWEU5NTQ4NEM0TIQ2NFQ2RUtIUC4u>