National Association of Home Builders

Scaffold and Ladder Safety Training

NAHB – OSHA Instructors Guide

General Guidelines

Please make sure to pre-plan your training sessions at least 3 weeks in advance. This should include contact with the sponsoring HBA to ensure location, date, time is correct. Also make sure proper equipment such as projector etc. is available or prepare to bring your own.

Day of training please make sure you arrive at least 30 minutes prior to class beginning to set up the class room for a successful session. Make sure you know where to go in case of emergency, and the location of the restroom(s).

Slide 1: Opening Slide

Introduce yourself stating your experience, and say welcome to the NAHB Scaffold and Ladder Safety Training. Keep this brief and you may ask the occupation and experience of attendees.

Review the rules of the class:

- Cell phones off/vibrate
- Restroom location
- Closest emergency evacuation point and meeting location to account for all attendees in the case of an emergency.
- When the attendees will have time for questions
- That you will be available after the session as well

Slide 2&3: Disclaimer

Instruct the students to read the disclaimer.

Slide 4: Introduction

State importance of why preventing falls from scaffolds and ladders is a major concern for residential construction. Identify the many applications each piece of equipment has on the jobsite, and the potential for injury/death from improper use.

Slide 5: Introduction, cont.

Introduce the supporting NAHB handbooks and videos. Explain that the publications and videos were developed by NAHB to assist the residential construction industry with the understanding and compliance of the OSHA fall protection and scaffold requirements. State how the information and resource materials from the seminar can be used:

- Provide training to employees
- Implement a scaffold and ladder safety program

Slide 6: Course Objectives

By completing this course participants will be able to:

- Identify the importance of preventing falls from ladders and scaffolds.
- Recognize fall hazards associated with ladder and scaffold use.
- Identify OSHA requirements for ladders, stairways, and scaffolds.
- Identify work practices for using ladders and scaffolds safely.

Slide 7: Course Agenda

This course consists of five instructional sections.

Section 1: Overview of Training Program
Section 2: Ladder Safety
Section 3: Scaffold Safety
Section 4: Group Workshop
Section 5: Post Test and Review

 **Slide 8: Overview (transition slide)**

 **Slide 9: Why is Preventing Falls from Ladders and Scaffolds Important?**

There is no surprise that falls continue to be the leading cause of fatalities in residential construction. Falls represented **45% or 602** of residential construction fatalities from 2003-2006. Of the **602** fall fatalities **135 (22%)** were falls from ladders, and **89 (15%)** were falls from scaffolding.

State that the statistics are from the 2008 NAHB fatality study.

 **Slide 10: Fatalities by Event or Exposure: Residential Construction**

Go over how the fatalities were broken up, placing emphasis on the fall data. Ask to see a show of hands by how many people have or know someone that has been exposed to the same situations that has killed others that you are speaking about.

 **Slide 11: Fall Fatalities: Residential Construction**

Emphasize why preventing falls from scaffolds and ladders is important. They represent number 3 and number 2 respectively, of the top 3 fall fatalities in residential construction. Also, highlight the numbers from the remaining categories.

 **Slide 12: Most Frequently Cited Serious Violations In Construction - 2007**

Review top 10 OSHA citations and explain how 6 out of the top 10 relate to this course. Briefly review with the participants the requirements for each of the citations listed that relate to this course. You may ask who has had an OSHA inspection and/or who is concerned about one.

 **Slide 13: OSHA: Scaffold and Ladder Citations**

Review the results of the two actual OSHA inspections and the potential penalties that an employer could face for failing to comply with scaffold and ladder requirements regarding scaffold fall protection and ladder placement. Further explain that although avoiding citations/penalties is a motivator, keeping employees safe and healthy should be the primary concern.

 **Slide 14: OSHA Fall Protection Requirements**

Review the following fall protection requirements:

- Subpart L – Scaffolds
  - Each employee on a scaffold more than **10'** (3.1M) above a lower level shall be protected from falling to a lower level.
- Subpart X – Ladders
  - Fall protection is **not** required for workers climbing or working on portable ladders.
- Subpart X – Stairways
  - Stairways having four (4) or more risers or rising more than 30 inches must be equipped with at least on handrail; and one stairrail system along each unprotected side or edge.

Slide 15: OSHA Fall Protection Requirements cont.

Review the following fall protection requirements:

- Subpart M – Fall Protection
  - Residential construction. Each employee engaged in residential construction activities **6'** or more above lower levels must be protected by conventional or alternative fall protection:
  - ***Exemption****: When the employer can demonstrate the protection is infeasible or creates a greater hazard the employer must develop a alternative fall protection plan*

Speak to the different height requirements for scaffolds and general fall protection in construction workplaces.

Slide 18: How do you prevent falls from ladders and scaffolds?

State the first steps to preventing falls from scaffolds and ladders are:

- Implement a comprehensive safety program
- Understand OSHA ladder and scaffold regulations
- Train workers to identify hazards associated with ladder and scaffold use
- Use safe work practices

Slide 19: Section 2 – Ladder and Stairway Safety (transition slide)

Slide 20: Learning Objectives: Section 2

By completing this section, participants will be able to:

- Determine the proper ladder to use based on weight capacity and height.
- Calculate the proper pitch of extension ladders for proper set-up, and identify how to secure and stabilize ladders.
- Identify how to maintain a safe position when using a ladder.
- Identify safety requirements for protecting stairways

Slide 21: Common Ladder Hazards

Review these common hazards relating to ladder use:

- Improper set-up
- Portable ladders not 3 feet above landing surface
- Not securing ladder correctly
- Standing on the top two steps of a stepladder
- Overreaching when working from a ladder

Slide 22: Choosing the Right Ladder

State that before stepping onto a ladder, you must think about these things:

- Duty rating of the ladder—what capacity can it hold?
- Height of the ladder—too short or too tall?
- Condition of the ladder and instructions unique to the ladder selected.

Slide 23: Proper Duty Rating/Capacity

Ask if anyone knows the duty rating of their ladders?
Go over how easy it is to go over capacity when you add tools or materials.

Review OSHA's requirement for ladder duty rating and capacity.

- Ladders shall not be loaded beyond the maximum intended load for which they were built nor beyond their manufacturer's rated capacity.

Slide 24: Proper Duty Rating/Capacity, cont.

Indicate that the chart is also in the Fall Protection Book Page 12, and briefly review each type/duty rating/use/load included on the chart.

Slide 25: Extension Ladders (transition slide)

Slide 26: Proper Ladder Set-up

Review the proper set up:

- Consider placement and pitch of the ladder
- Secure and stabilize the ladder

Slide 27: Pitch Extension Ladders

Review proper pitch:

- Extension ladders should be used at a 4 to 1 pitch (1.2 to .3 m).
- For every 4 ft. (1.2 m) in height, the bottom of the ladder should be 1 ft. (.3 m) away from the structure.

Example:

- 20 ft. (height) ÷ 4 ft. = 5 ft. pitch

Slide 28: Pitch Extension Ladders, cont.

Setting up extension ladders properly can reduce slip and overload hazards. A quick and easy way to determine if an extension ladder is properly set up is to:

1. Place toes against ladder side rails
2. Stand erect
3. Extend arms straight out
4. Palms of hands should touch top of rung at shoulder level

Also, point out the ladder label that assists with proper pitch.

Slide 29: Proper Height Extension Ladders

Ask: Why are ladders required to extend above the landing by 3 ft. when accessing another level?

Explain this provides a handhold for getting on and off of the ladder.

Slide 30: Proper Height for Extension Ladders, cont.

Review extension ladder chart and explain that ladder heights are longer than the height to be reach to allow for the height/length lost when the ladder is positioned at an angle.

Pick a height and discuss why it is not just a 3’ adjustment and how the pitch falls into the height requirement.

Slide 31-34: Secure and Stabilize Ladders

Discuss the different ways to secure the ladder at top and bottom. Refer to page 28 in fall protection book for ladder leveler legs and stabilizer bars.

Slide 35: Loose Soil

The spikes, or spurs, on the ladder safety feet allow for the ladder to be set up safely on loose soil to prevent slipping.

Slide 36: Step Ladders (transition slide)

Slide 37: Step Ladders

Start discussion on step ladders. Use a war story to relate the subject or ask if anyone has fallen off a ladder.

Review the following requirements for step ladders:

- Only used in the fully open position on firm level ground
- Do not use a stepladder that is folded or in a leaning position
- Never sit/stand on the top two rungs
- Consider work height when selecting a stepladder

Slide 38: Step Ladders, cont.

Review the following requirements for step ladders:

- Stepladders are designed for use in an opened-and-locked position.

Also review the photo with the ladder in the proper position, and the worker properly positioned on the ladder.

Slide 39: Step Ladders, cont.

Review the following requirements for step ladders:

- Do not use a stepladder that is folded or in a leaning position

Explain why leaning step ladders are dangerous. The fact it could kick out and that it is designed to take the load when fully open and you cut down the load by leaning it.

Slide 40: Proper Height Stepladders

Review the chart stating that an easy way to remember is take working height (maximum height you need to reach) and subtract 4'. This, in most cases, will work for selecting the proper step ladder.

Slide 41: Maintain a Safe Position on Ladders

Review the keys to maintaining a safe position while on a ladder:

- Face the ladder when ascending or descending
- Maintain three points of contact at all times
- Keep your body centered on the ladder
- Never let your belt buckle pass either side rail

Slide 42: Maintaining a Safe Position on a Ladder, cont.

Explain that this photo shows a worker:

- Facing the ladder when climbing
- Maintaining three points of contact
- Keeping his body centered on the ladder

Also, point out the tool belt to carry his tools, instead of carrying them in his hands. Another option is to raise and lower tools/materials from the roof with a rope.

Slide 43: Ladder Inspections

Explain that ladders must be inspected for visible defects and after any occurrence that could affect their safe use.

Then review:

- Ladders must be inspected before each use
- Broken or weak ladders or ladders that are not stable must be marked or tagged as defective and taken out of service.
- Look for cracks and weak points

Slide 44:

Point out the "in field fix" for the ladder and why this is not a proper solution.

Explain: Ladder repairs must restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use and "in field fixes" does not meet this requirement.

Slide 45: Review the Safety Labels on the Ladder

Discuss the different ladder labels and how they should be affixed to the ladder and legible. Other labels may warn of electrical hazards, duty ratings, and proper set up.

Slide 46: Additional Safe Work Practices: Ladders

Review the additional safe work practices to be followed which can also prevent the potential for falls from a ladder:

- Extension ladders should not be separated to create two ladders
- Keep the areas around the tops and bottoms of all ladders clear to prevent trip-and-fall hazards
- Avoid setting ladders up in high traffic areas or barricade the area around ladder

Slide 47: Additional Safe Work Practices: Ladders, cont.

Review the additional safe work practices to be followed which can also prevent the potential for falls from a ladder:

- Ladders must be kept free of oil, grease, and other slipping hazards.
- Consider using a rope to raise/lower materials instead of carrying items while climbing a ladder
- Do **NOT** use metal or aluminum ladders near exposed energized electrical equipment

Slide 48: Section 3 – Scaffold Safety (transition slide)

Slide 49: Learning Objectives: Section 3

By completing this section, participants will be able to:

- Identify general requirements for safely building and using scaffolds
- Identify competent person responsibilities
- How to access scaffolds safely
- Determine proper fall protection including guardrails and personal fall arrest systems
- Identify safety requirements applicable to specific types of scaffolds

Slide 50: Common Scaffold Hazards

Review the common scaffold hazards:

- No guardrails on scaffolds
- Defective wood planks and inadequate planking overhang
- Unsafe access to scaffold
- Cross bracing not adequate
- Inadequate footings
- Bridging of scaffolds

Slide 51: General Requirements

Discuss the general requirements:

- Erect/dismantle all Scaffolds According to the Manufacturer's Instructions and Competent Persons (CP) Direction
  - Capacity
  - Must support 4x Intended Load
- Stable Footings
  - Base Plate, Screw Jacks & Mudsills

Slide 52: General Requirements, cont.

Discuss the general requirements:

- Platforms at Least 18” Wide
  - Ladder Jack, Pump Jack, Top Plate, and Roof Brackets Can Be 12” Wide
  - Front edge of all platforms within 14” of face of work
    - **Exceptions**:
      - 3” for outrigger scaffolds
      - 18” for plastering and lathing operations

Slide 53: Scaffold Capacity

Explain the importance of scaffold capacity, and how it relates to falls from scaffolds (i.e. scaffold collapse).

Review the following OSHA requirements:

- Scaffolds must be capable of supporting its own weight and at least 4x the expected load
- Expected load includes:
    - Workers
    - Equipment
    - Tools
    - Materials

Slide 54: Scaffold Capacity, cont.

Explain that this slide is designed to reinforce the "4x intended load" requirement. The combined weight **(600 lbs)** of workers, tools, and materials multiplied by 4 means scaffolds must be built to support essentially the weight of a small car.

Slide 55: Base Plate & Mudsill Required

Is there anything wrong here? Discuss base plates and how securing them is required

Slide 56: Proper Scaffold Base

Discuss base plates and how you can nail them down

 **Slide 57: Masonry Blocks & Bricks NOT Acceptable as Scaffold Base**

Discuss how using masonry blocks and bricks is dangerous, and how they could possibly collapse under the weight of the scaffold. Also remind the class of 4 times the intended load

 **Slide 58: Scaffold Platform**

Review the platform requirements:

- Each platform on all working levels must be fully planked and secured to prevent movement
- No more than a 1" space between decking/platform units and upright supports
- Wood scaffold planks must be nominal 2" x 10"
- Must be Scaffold Grade Planks or equivalent

 **Slide 59: Scaffold Grade Plank Stamp**

Discuss grade stamps and why you should not just use 2x6 pine.

 **Slide 60: Planks with Visible Defects MUST NOT be Used**

Explain why the scaffold planks are bad. Planks with visible defects cannot be used as scaffold platforms. This includes extensive cracks or rotting. Also, remind them of the accident that the work platform disintegrated below the worker.

NOTE: Once scaffold planks have been used as mudsills, they must never be used for anything else. The point loading of the scaffold legs may have weakened the plank.

Slide 61: Scaffold Use

Review and discuss each point:

- Front Edge Within 14” of Face
- Plank Extends 6” Past Supports or Secured
- Don’t Paint Platforms (sides for ID)
- Brace Fully

Slide 62: Front Edge within 14” of Face

For most types of scaffolds found on residential jobsites, the maximum distance from the front edge of the platform must not be more than 14”. Unless, guardrails are installed along the front edge or personal fall arrest systems are used to protect workers from falling.

Slide 63: Scaffold Plank 6” Past Support

Ends of platforms must extend at least 6” over the center line of the support, if not equipped with cleats or hooks.

Also, point out the uplift pin.

Slide 64: Scaffold Plank Cleat

Explain why the use of cleats is a good practice. Some fabricated scaffold planks are made with hooks to restrain the platform from movement. In this case cleats were installed using 2x4 lumber to prevent movement.

Slide 65: Fully Braced Scaffold

Speak to all of the good points of this scaffold. This scaffold has cross bracing installed and secured according to the manufacturer's instructions. Failing to properly brace scaffolding can create instability, resulting in an unsafe condition.

Slide 66: Competent Person Responsibilities

Explain the need for a Competent person and how the scaffold competent person may be different from the sites overall competent person or the fall protection competent person. And why is this person important.

Review the responsibilities for the scaffold competent person:

Designated *competent person* responsibilities:

- Designated by the **employer**
- Has the knowledge and experience required to **identify** existing and predictable hazards
- Has authority to **eliminate** unsafe working conditions
- Has authority to **stop work** if unsafe conditions exists
-

Slide 67: Competent Person Responsibilities, cont.

- Train employees who erect, dismantle, move, or alter scaffolds
- Determine if it is safe for employees to work on or from a scaffold during storms or high winds
- Inspect scaffolds and scaffold components for visible defects before each work shift

Slide 68: Scaffold Access

Review need for access:

- Ladders Needed if Access More Than 2’
- Don’t Climb Cross Braces
- Place Ladders Securely
  - Ladders must be positioned so they will not tip the scaffold

Also, explain some of the different methods of providing access:

- Portable ladders
- Attachable ladders
- Built-in stairways

Slide 69: Scaffold Access, cont.

- Access to or from another surface (such as a window) can only be used when the scaffold is:
  - No more than 14” horizontally, **and**
  - No more than 24” vertically from the other surface

Slides 70: Portable Access Ladder

Review the requirements for provide access using portable ladders:

- Must be secured to prevent displacement
- Extend at least 3’ above landing to provide a handhold

Slides 71: Attachable Access Ladder

This photo shows an attachable access ladder to provide access to this scaffold.

Slides 72: Scaffold Stairway

Although this may not be common on residential jobsites, some manufacture's have built-in stairways to allow easy, safer access to the scaffold.

Slide 73: Scaffold Fall Protection

Review basic fall protection requirements for scaffold:

- Scaffolding 10' or higher must have some means of fall protection
  - guardrails or
  - personal fall arrest system (PFAS)
- Toprails installed between 38" and 45" High
- Midrails installed halfway between toprail and platform
    - Cross bracing OK as guardrails if the center point is between **20" to 30"** for **Midrail** and **38" to 45"** for **Toprail**
- Toprails to 200 lbs. of force/Midrails to 150 lbs. of force in any direction

Slide 74: Scaffold Fall Protection, cont.

- Erection and Dismantling
  - Fall protection should be used when feasible and when it does not create a greater hazard
  - Competent person determines the feasibility and safety of providing fall protection

Slide 75: Falling Object Protection

Speak about overhead hazards and how to protect workers:

- Anyone working on or around a scaffold must wear a hard hat
- Workers on or below scaffolds must be protected from falling objects by:
    - Toeboards
    - Mesh
    - Screens; or
    - Equivalent measures

Slides 76: Falling Object Protection, cont.

Review picture showing the toeboard serving as the falling object protection. Also, restate the height requirements for toeboards.

Slides 77: Falling Object Protection, cont.

Review the picture showing the mesh serving as the falling object protection.

Slide 78: Scaffold Safety Training

Ask the participants why training is important?

Review the training requirements:

- Conducted by a qualified person in the subject matter to recognize the hazards
- Topics must include:
    - Electrical Hazards
    - Fall Protection
    - Falling Object Protection
    - Proper Use
    - Material Handling
    - Load-carrying Capacities

Slide 79: What type of scaffold do you use?

What's wrong here?
Do you think these guys are trained?
Explain some of the hazards presented in the photo.

Slide 80: Types of Scaffolds Covered

In this section we are going to review the basic requirements for various types of scaffolds that are typically found on residential jobsites. These include:

- Fabricated Frame Scaffold
- Pump Jack Scaffold
- Ladder Jack Scaffold
- Trestle & Horse Scaffold
- Mobile Scaffold
- Roof Bracket Scaffold
- Top Plate Scaffold
- Aerial Lifts
- Work Platforms attached to forklifts

Slides 81-85: Fabricated Frame

Review some of the specific requirement for fabricated frame scaffold

Slides 86-90: Pump Jack Scaffold

Review the pump-jack pictures and point out base plates, access, bracing etc. Also, stress the importance of strictly following the requirements regarding the use of wood poles with pump jack scaffolds.

Slides 91-94: Ladder Jack Scaffold

Go over specifics for Ladder Jack scaffold

Slides 95-97: Trestle & Horse Scaffolds

Show the difference of the trestle and saw horse scaffold. Speak about cross bracing of saw horse scaffold and where the information can be found on specifics

Slide 98-99: Mobile Scaffold

Review the requirements of a mobile scaffold

Slide 100: Roof Bracket Scaffold

Review uses of roof bracket scaffold and specific requirements

Slides 101-104: Top Plate Scaffold

Explain top plate scaffold and some uses for them. Also review the specific requirements for using this scaffold as well as properly bracing.

Slides 105-110: Aerial Lifts

Go over specific hazards and requirements of aerial/boom lifts. Point out 10’ rule for electricity and what a good idea of a trained ground person is. Also fall protection requirements

Slides 111-117: Work Platforms Attached to Forklifts

Go over specific hazards and requirements of work platforms attached to forklifts. Point out 10' rule for electricity and what a good idea of a trained ground person is. Also fall protection requirements

Slide 1118: Section 4 – Group Workshop (transition slide)

Start Break out Workshop

Slide 119: Hands On Activity #2

Start hazards recognition work shop. Start out by telling everyone you are going to show them the pictures of your scaffold and they need to tell you what they find wrong and why. Let them play OSHA Inspector for this exercise.

Slide 120: Picture #1

Make sure they point out the footing

Slide 121: Picture #2

Point out fall hazard, access, hard hat, window sill, lack of training

Slide 122: Picture #3

Speak about the job built scaffold, need for access, 4 times and the intended load

Slide 123: Picture #4
Go over the hazard of the blocked stairs and the lack of a level work surface and the make shift support.

Slide 124: Picture #5
Look at placement of rails, cross braces, work surface. Ask if they would look twice at this scaffold compared to the others

Slide 125: Picture #6
Worker setting trusses off a ladder instead of top plate

Slide 126: Picture #7
What can happen here straddling ladder?

Slide 127: Picture #8
Is there anything wrong in this picture? What about the braces.

Slide 128: Picture #9
Good pic

Slide 129: Picture #10
Ladder 3' what could happen

Slide 130: Picture #11

Point out leaning support, lack of fall protection, lack of proper access, ladder angle, etc. If this is what your site looks like you need to get to work.

Slide 131: Picture #12

Angle of ladder etc.

Slide 132: Picture #13

What could be done here to make it safer?

Slide 134: Section 4 – Post Test and Review (transition slide)

Give out test and then give out survey. Make sure everyone completes both. IF time allows make sure you have the class switch papers and grade each others. This will let them hear the correct answers and that way they can ask questions if time allows

Slide 135: NAHB Labor, Safety & Health Department

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