Approximate Lesson Time

1 Hour

Fall Prevention: Module 2

Scaffolds and Guardrail Systems

START MODULE

on the agenda

- Introduction
- Scaffolds
- Guardrails Systems
- Summary

VIDEO
PLACEHOLDE

What went wrong?

The worker….

1. was not wearing a personal safety harness.
2. was climbing and stepping on the guardrails.
3. should have used the scaffold ladder to go to another level.
4. did not understand proper safety precautions.
5. should have asked questions if he was unsure about safety.

What went wrong?

The employer….

1. did not have any written safety rules of procedures.
2. did not provide fall protective equipment to the workers.
3. did not conduct inspections of the erected scaffolding.
4. did not provide safety signs that foreign-born workers could understand.
5. did not consider worker safety in all parts of the project.

What should have happened?

Recommendation #1 | Recommendation#2 | Recommendation #3 | Recommendation #4 | Recommendation #5

Where the potential for a fall from an elevation exists, employers should ensure that fall protection equipment is provided and used by workers.

The use of safety belt/lanyard combination is required by 29 CFR 1926.104. Use of the **safety body harness/lanyard with a rope grab device and lifeline** could have prevented the worker from falling. This type of fall protection permits employees to move about the scaffold without being restricted while still providing fall protection.

What should have happened?

Recommendation#1 | **Recommendation #2** | Recommendation #3 | Recommendation #4 | Recommendation #5

Employers should conduct **initial and periodic inspections** of erected scaffolding.

The loose or unsecured guardrail may have been identified and corrected had proper installation, initial inspection, and/or periodic inspection procedures been used.

What should have happened?

Recommendation #1 | Recommendation#2 | **Recommendation #3** | Recommendation #4 | Recommendation #5

Employers should comply with OSHA standards 1926.451 (a)(4), which requires guardrails and toeboards be installed on all open sides and ends of platforms more than 10 feet above the ground or floor.

And 1926.451(a)(6), which requires screens between guardrails and toeboards where persons are required to work or pass under the scaffold.

What should have happened?

Recommendation #1 | Recommendation#2 | Recommendation #3 | **Recommendation #4** | Recommendation #5

Employers should ensure that foreign-born workers fully understand all information, particularly safety-related information, relating to their jobs.

The program should include a competent interpreter to explain the safety regulations to the foreign-speaking employees. The employer should develop and post safety posters/signs in that language.

Workers should ask questions or raise concerns if they feel unsafe.

What should have happened?

Recommendation #1 | Recommendation#2 | Recommendation #3 | Recommendation #4 | **Recommendation #5**

Worker safety should be considered and addressed in the planning phase of all work projects.

The employer should design, develop, implement, and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards.

What will this module cover?

- About 65 percent of the construction industry work on scaffolds.
- In NYC, 58 percent of construction death were from falls. Out of that, 25 percent happened in scaffolds.
- Protecting workers from scaffold-related accidents may prevent some of the 4,500 injuries and over 60 deaths every year.


Scaffolds

What is a scaffold?

WHAT IS A SCAFFOLD?

Click the **button** to see the definition.

What is a scaffold?

WHAT IS A SCAFFOLD?

Click the **button** to see the definition.

A scaffold is an elevated, temporary work platform.

Click the **audio icon** to hear the definition.

Supported Scaffolds

consists of one or more platforms supported by rigid, load- bearing members, such as poles, legs, frames, outriggers, etc.

Suspended Scaffolds

one or more platforms suspended by ropes or other non-rigid, overhead support.

Other types

scissor lifts and aerial lifts, can be regarded as other types of supported scaffolds. The picture is of a scissor lift.

Match the scaffold with the correct pictures.

A. 

B. 

C. 

A. Supported scaffold

B. Suspended scaffold

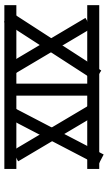
C. Scissor lift.

SUBMIT

How are workers getting hurt and dying from scaffolds?

Falls to below because of no fall protection.

Collapse of the scaffold caused by instability and overloading.



Struck by falling tools, work materials, or debris.

Electrocution because of overhead power lines.

Drag and drop the picture to match the description.

How are workers getting hurt and dying from scaffolds?

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SUBMIT

Who works with scaffolds?

Erectors / Dismantlers

Users

Designers

Click the **buttons** on the left to see the details.

Who works with scaffolds?

Erectors / Dismantlers

Users

Designers

Erectors / Dismantlers

- These are the people that build (erector) or take down (dismantler) a scaffold.
- Erectors and Dismantlers must be trained by a competent person.
- The scaffold must be designed or planned out by a qualified person.

Who works with scaffolds?

Erectors / Dismantlers

Users

Designers

Users

- These are workers whose work requires them to be supported by scaffolding to access the area of structure where that work is being done.
- A qualified person must train workers working on a platform.
- Workers must show certification that they have been properly trained to work on scaffolds.

Who works with scaffolds?

Erectors / Dismantlers

Users

Designers

Designers

- These people are specifically in charge of designing the scaffold.
- These are people who hold a college degree and are a registered engineer.

Choose the correct answer.

I'm here to erect the scaffold and when you're done working, tear it back down. Just another day's work.

Who is she?

- Designer
- Erector/Dismantler
- User

SUBMIT

Choose the correct answer.

I'm here to design and build the scaffolds for you. I hold an engineering degree so you are in good hands!

Who is he?

- Designer
- Erector/Dismantler
- User

SUBMIT

Choose the correct answer.

I just need the scaffold to be able to work and do my job.

Who is he?

- Designer
- Erector/Dismantler
- User

SUBMIT

What is a competent person?

Role

Click the **button** to
for details.

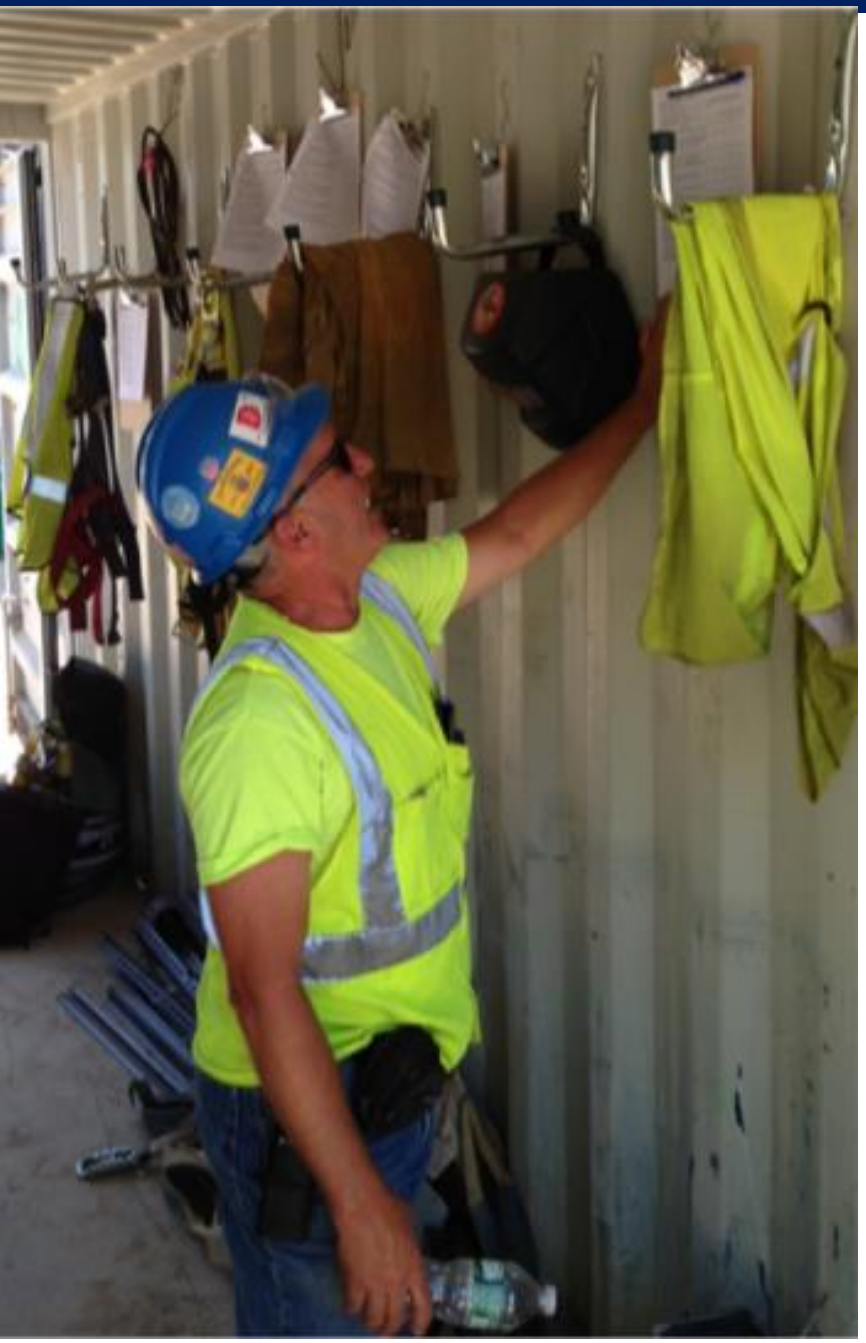
Job

What is a competent person?

Role

- Is capable of identifying existing and predicting dangers.
- Is authorized to take fast corrective actions to get rid of those dangers.

What is a competent person?



Job

- **Inspect** scaffolds and scaffold parts for visible defects before each work shift and after any occurrence which could affect the structural integrity and authorize prompt corrective actions.
- **Select and direct** employees who erect, dismantle, move, or alter scaffolds.
- **Make sure** if it is safe for employees to work on or from a scaffold during storms or high winds and that employees are wearing a personal fall arrest system or wind screens protect these employees.
- **Help train** employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds to recognize associated work hazards.

What is a qualified person?

Role

Click the **button** to
for details.

Job

What is a qualified person?

Role

- Holds a recognized college degree, certificate, or professional standing.

- Either by college or a long, history of experience, they have shown the ability to solve problems relating to the subject matter, the work, or the project.

What is a qualified person?

Job

- All scaffolds must be **designed and built** by a qualified person.
- A qualified person must do the **preplanning** to assure the safe erection and use of the scaffold. Preplanning includes:
  - Deciding the type of scaffold necessary for the job.
  - Deciding the maximum load for the scaffold.
  - Assuring a good foundation.
  - Avoiding electrical hazards.
- **Train** employees working on the scaffolds to recognize the associated hazards and understand procedures to control or minimize those hazards.

Drag and drop the responsibility to the right person.

I Inspect scaffolds for defects before each work shift

I've been in the industry long enough to be able to identify existing dangers and predict where there may be hazards.

I am authorized to act quickly if there's any danger that I see.

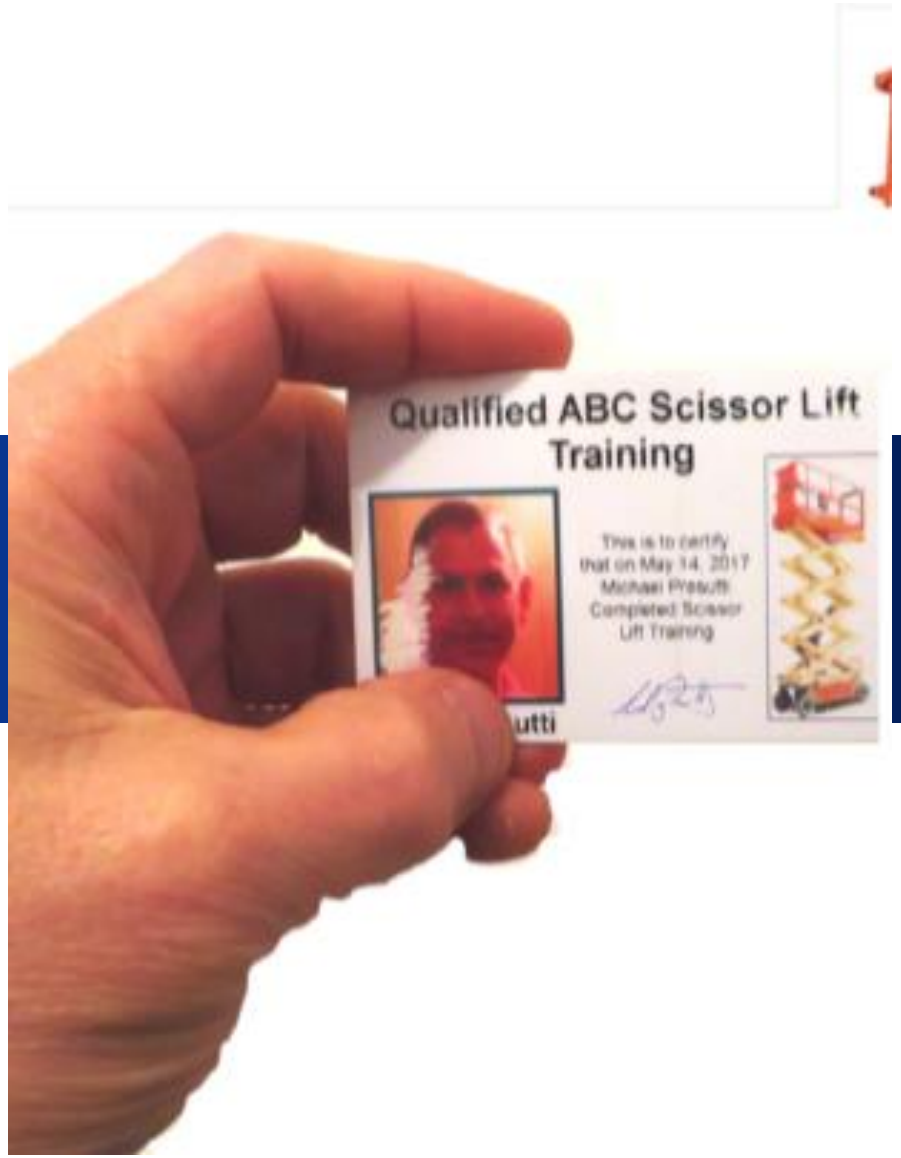
I have to do a lot of pre-planning before I start building the scaffolds.

Competent Person

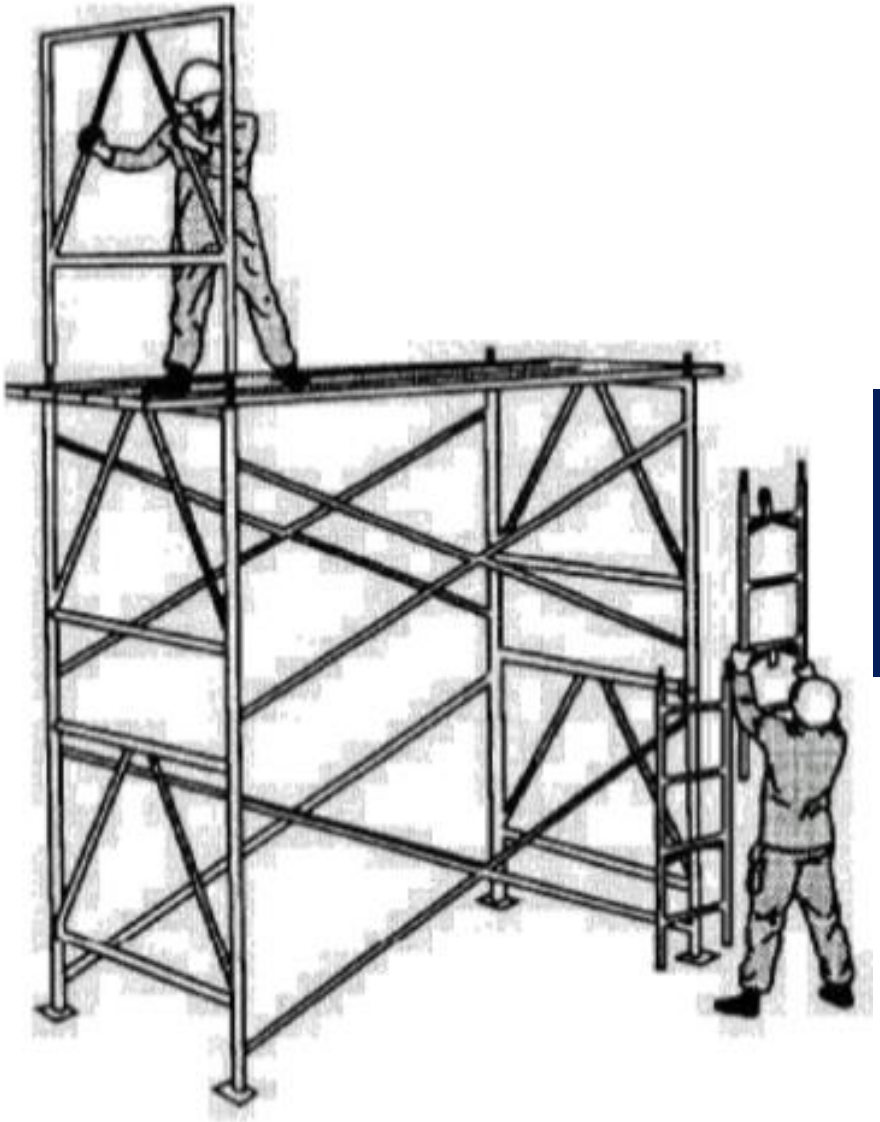
Qualified Person

SUBMIT

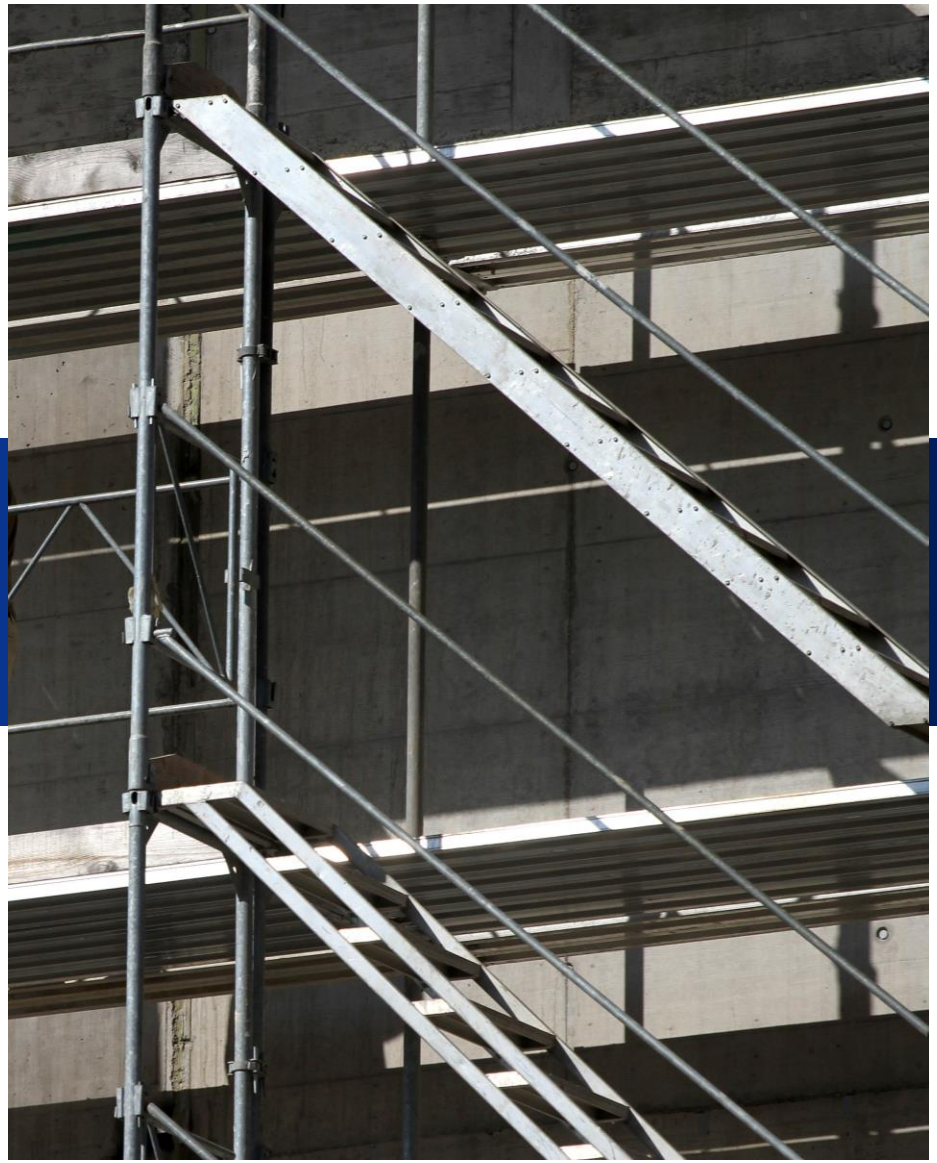
- Workers using scaffolds and personnel lifts must have training and **provide certified proof**.



- Scaffolds may only be erected, moved, dismantled or altered under the supervision of a Competent Person.



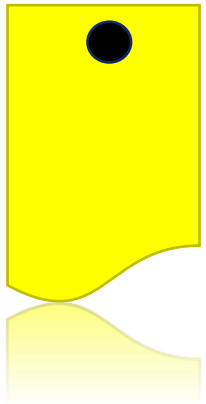
- In NYC, surfaces that are **6 feet** or higher must be equipped with a guardrail system.



Do NOT use scaffold unless it has been **inspected and tagged safe** for use by your Competent Person.

Inspection Tags

Green
Safe for use



Yellow
Caution

Red
Danger!!
Unsafe for use

True or False

My boss cannot ask me to provide proof that I have taken training.

- True
- False

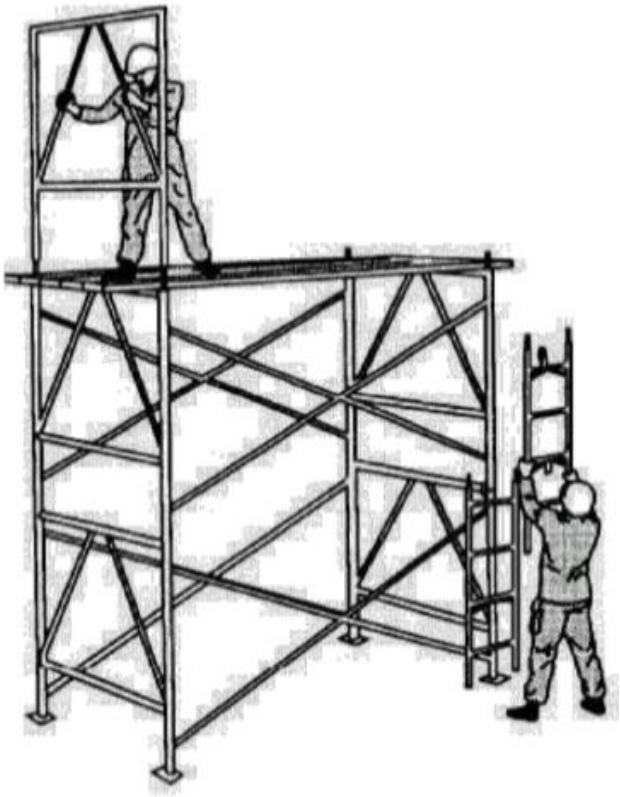
SUBMIT

Dropdown

The scaffold needs to be moved. I have to let the

_____ _____

know first.



Options on the drop down are:
Qualified person
Competent person
Erector/Dismantler

SUBMIT

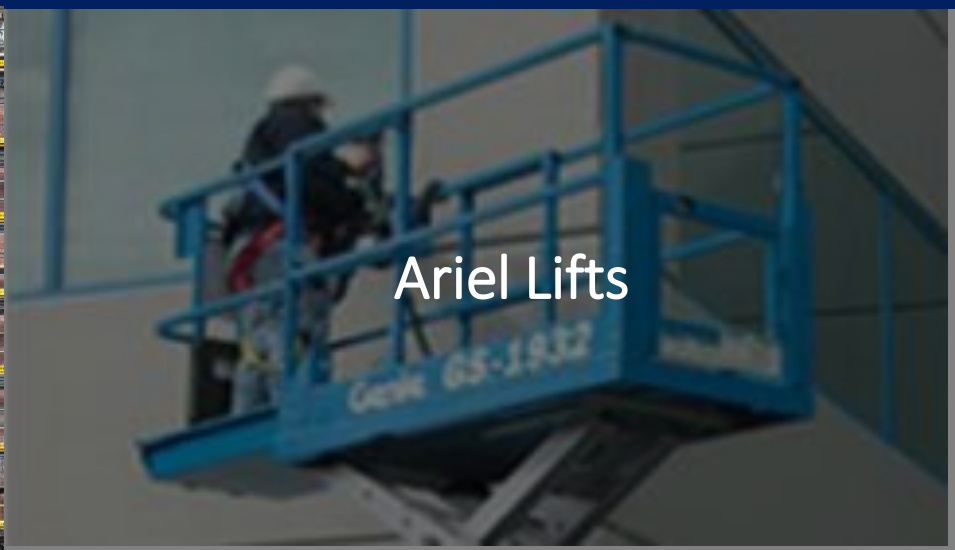
Multiple Choice

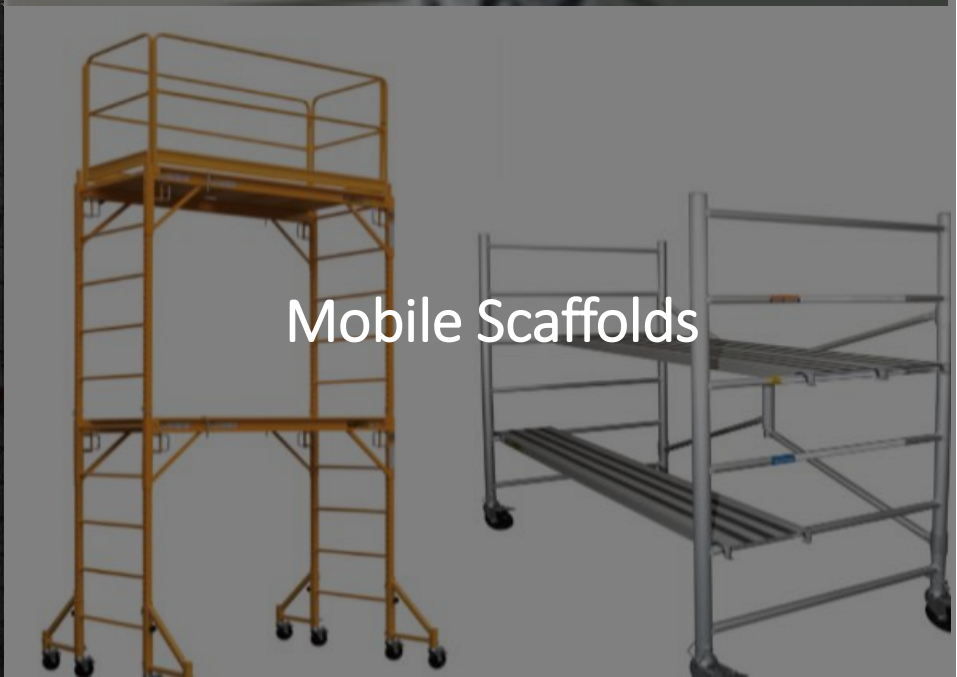
A red inspection tag means:

- Safe to use
- Caution
- Unsafe to use

SUBMIT

What do I need to remember when erecting scaffolds?





Supported Scaffolds

Scaffolds must be plumb (vertically straight), level, sturdy and braced.

When a supported scaffold reaches a height that is more than four times its minimum base dimension (4:1), it must be restrained by guys, ties, or braces to prevent it from tipping.

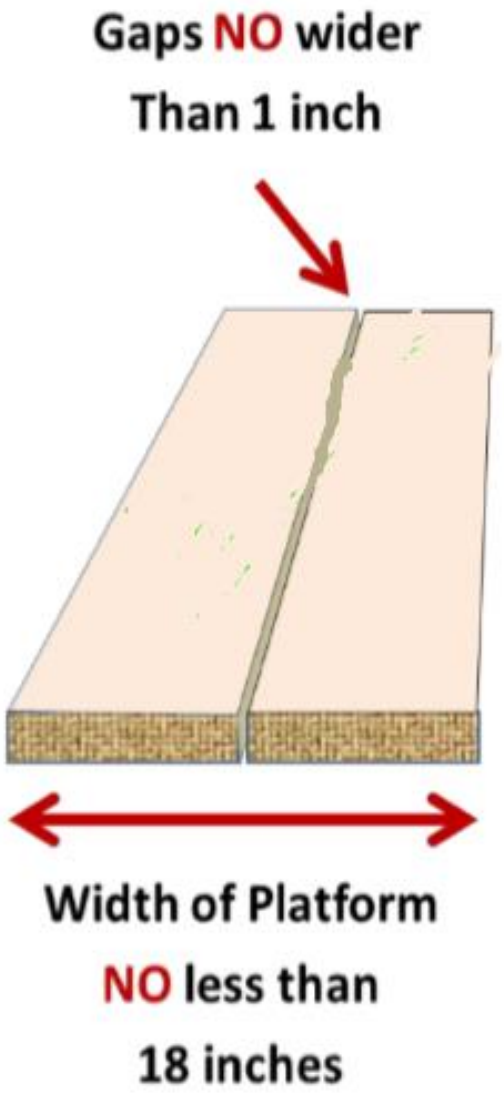
Supported Scaffolds

Scaffolds must be able to support their own weight and at least 4 times their maximum intended load without settling or displacement.

A scaffold can be overloaded by:

- Too many people being on the platform.
- Too much material being stored on the platform.
- Point loading, or concentrating too much of the load in one area.

Supported Scaffolds



There should not be any gaps more than 1 inch between planks.

Platforms should be 18 inches or wider.

Nothing that could cause a slip, trip or fall (i.e. tools, scrap material, chemicals, snow, ice, etc.) is allowed to accumulate on the platform.

Ladders, boxes, barrels, buckets or other makeshift platforms must not be used to increase the walking working height of scaffold platforms.

Supported Scaffolds

Never use scaffolds that do not have proper guardrails installed.

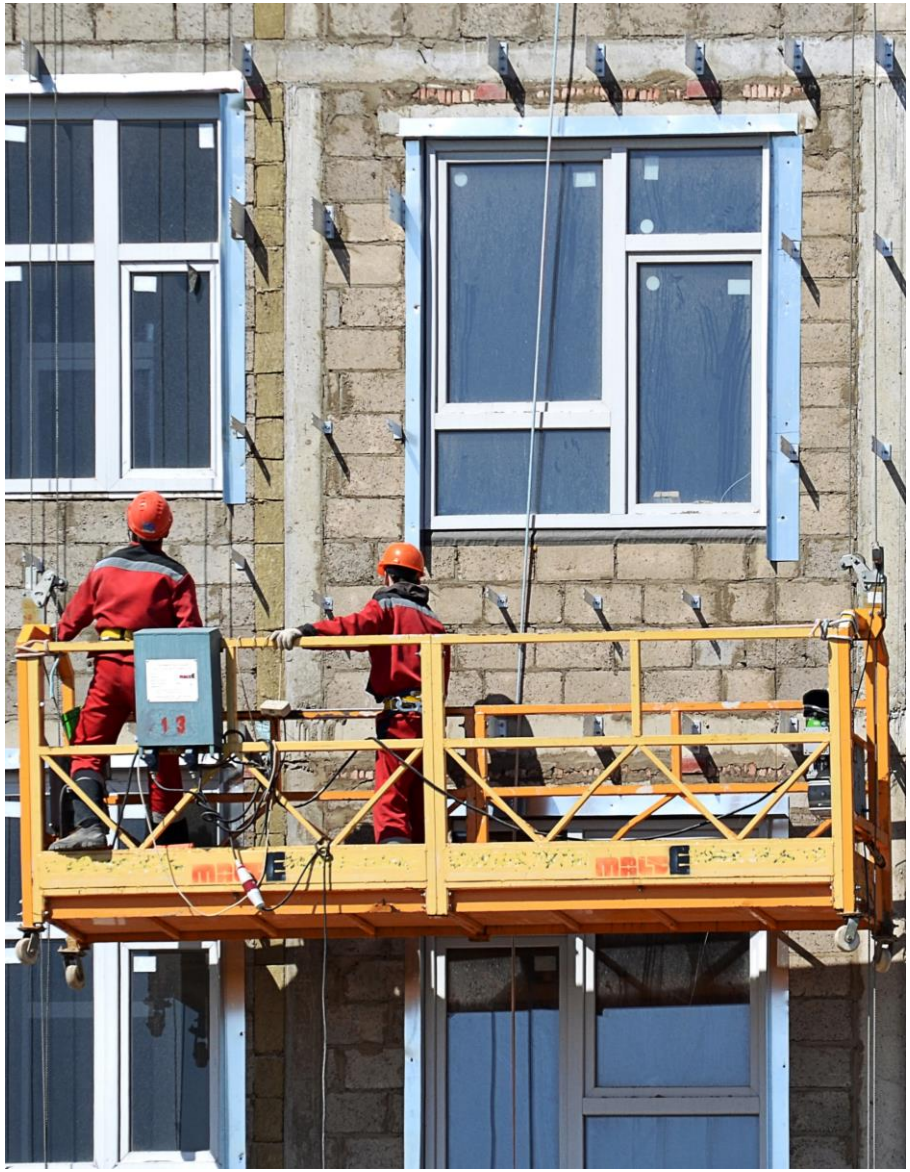
On supported scaffolds, workers can only tie-off to structural components of the scaffold.

Suspended Scaffolds

When working on a suspended scaffold, fall protection means having BOTH guardrail system and Personal Fall Arrest System (PFAS) with vertical lifelines.

A competent person must look at all direct connections prior to use to make sure that it can support the imposed load and inspect ropes for defects prior to each work shift.

All suspension scaffolds must be tied and secured so it doesn't sway in the wind. Another responsibility of a competent person.



Ariel Lifts

Only trained and authorized persons are allowed to operate.

Ensure that access gates or openings are closed.

Workers have to stand firmly on the floor of the basket.

Do not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

Use a body harness with a lanyard attached to the boom or bucket.

Do not belt-off to structures or poles close by while in the bucket.

Mobile Scaffolds

Casters and wheels must be locked to prevent movement while in a stationary position.

Before a scaffold is moved, each employee on the scaffold must be made aware of the move.

Workers should not ride on scaffolds.

Match the type of scaffold with the correct picture.

A.

B.

C.

D.

A. Mobile scaffold

B. Suspended scaffold.

C. Supported scaffold.

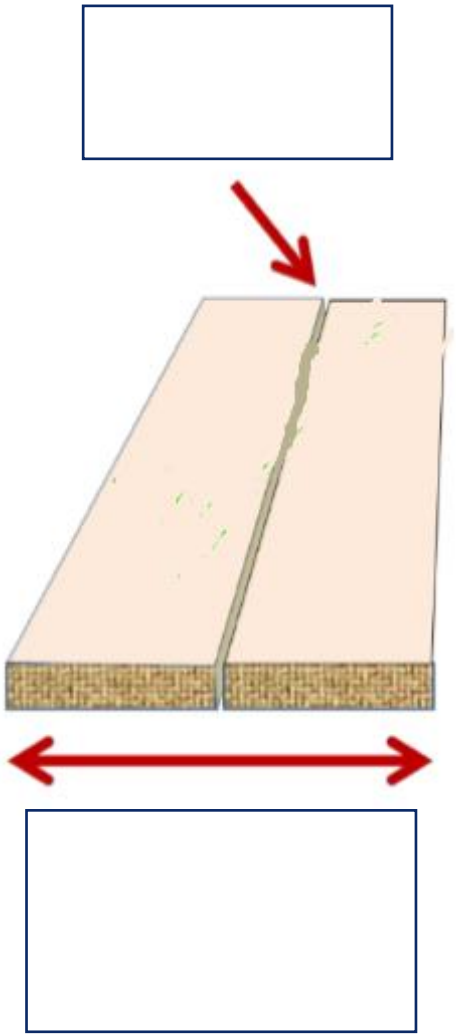
D. Ariel lift.

SUBMIT

Click the hazard in the picture.

Submit

Drag and drop the label to the correct spot.



Width of platform is NO less than 18 inches

Gaps NO wider than 1 inch

SUBMIT

True or False

When working on a suspended scaffold, I have to have BOTH guardrail system and personal fall arrest system.

- True
- False

SUBMIT

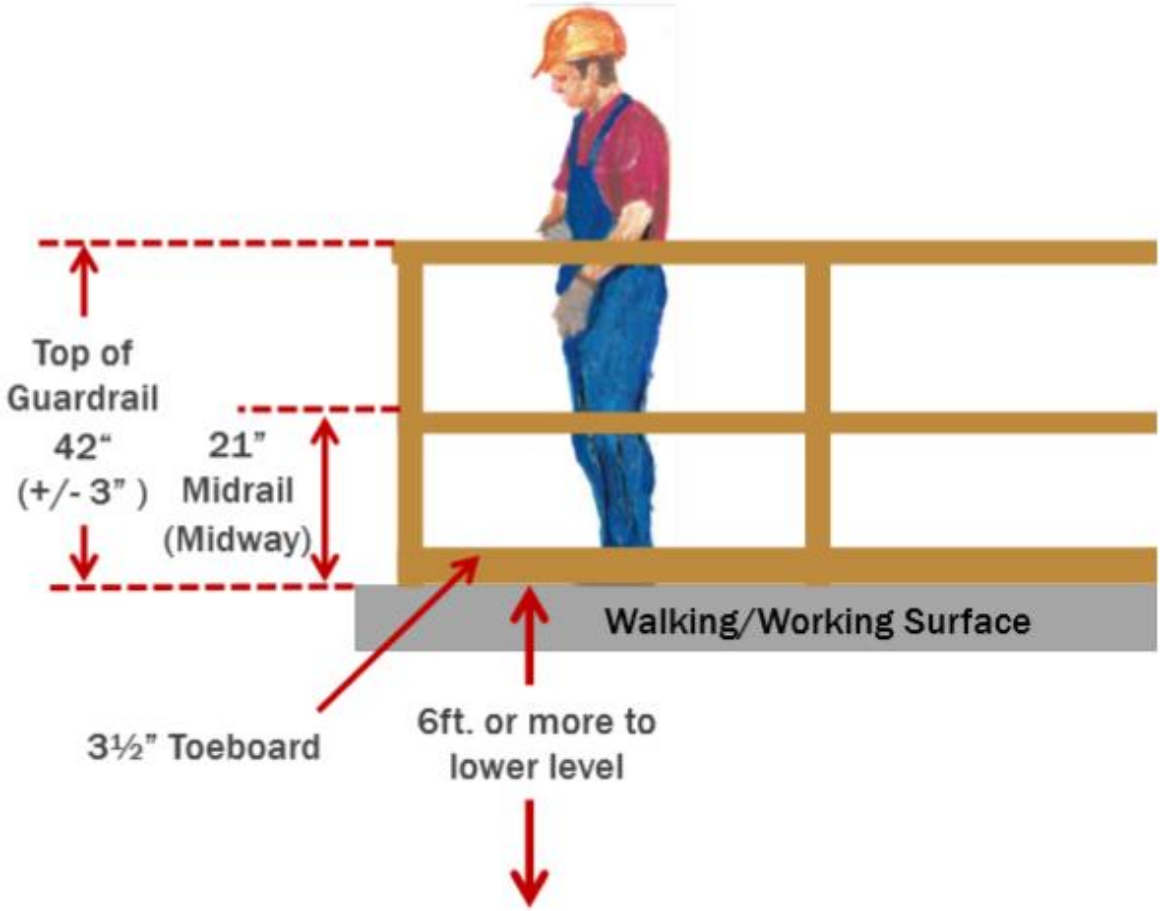

Guardrail Systems

Guardrails

Any unenclosed perimeter or unprotected area at **6 feet** or higher, the worker MUST be protected from falling!

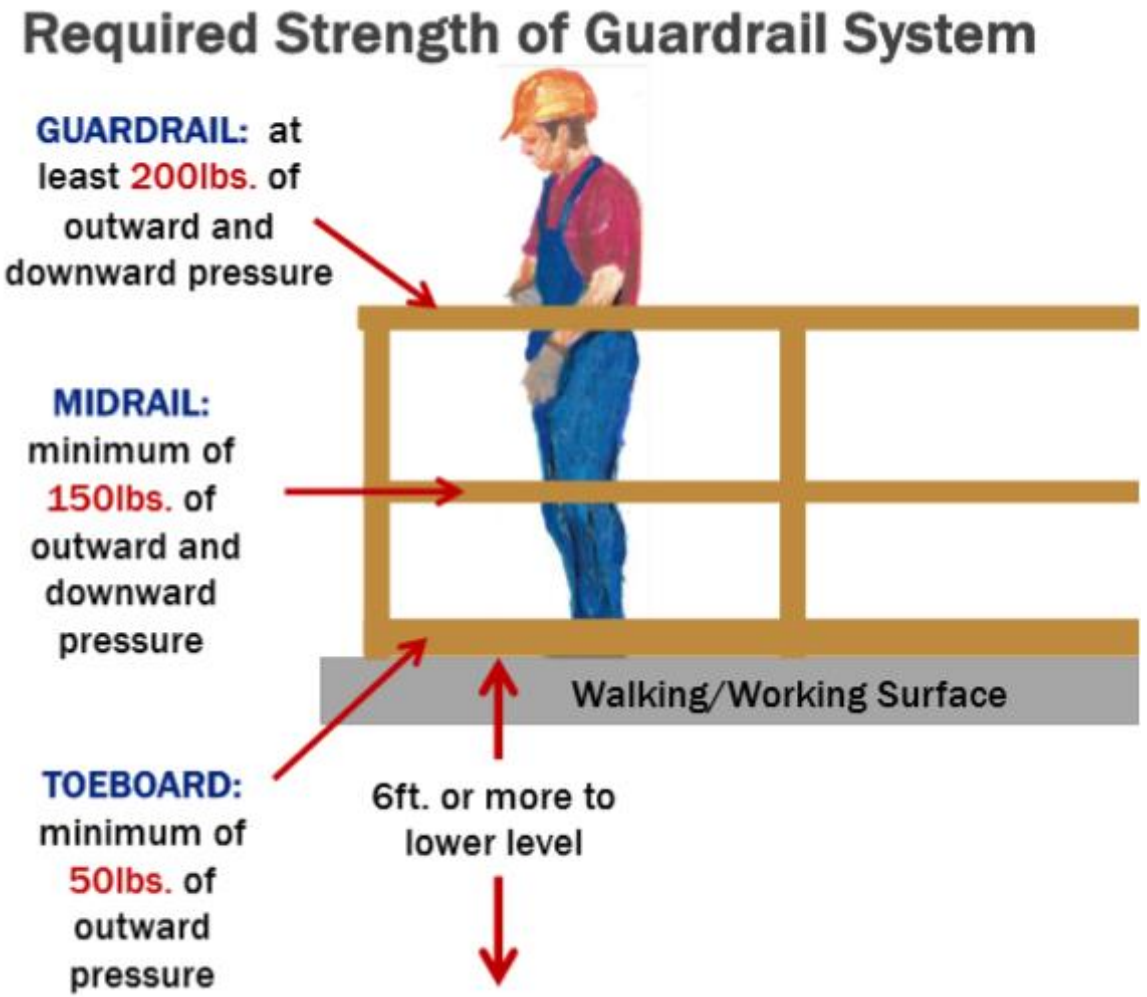
This is usually done by erecting guardrails.

It helps prevent falls to below and struck-by objects.



Strength

Guardrail systems are **NEVER** designed for leaning against!



Material

Guardrails must be constructed of construction grade lumber or non-corrosive wire cable.

If made with a wire cable, a tensioning system like a turnbuckle should be used to keep the wire as tight and taut as possible. There shouldn’t be any slack on the wire.

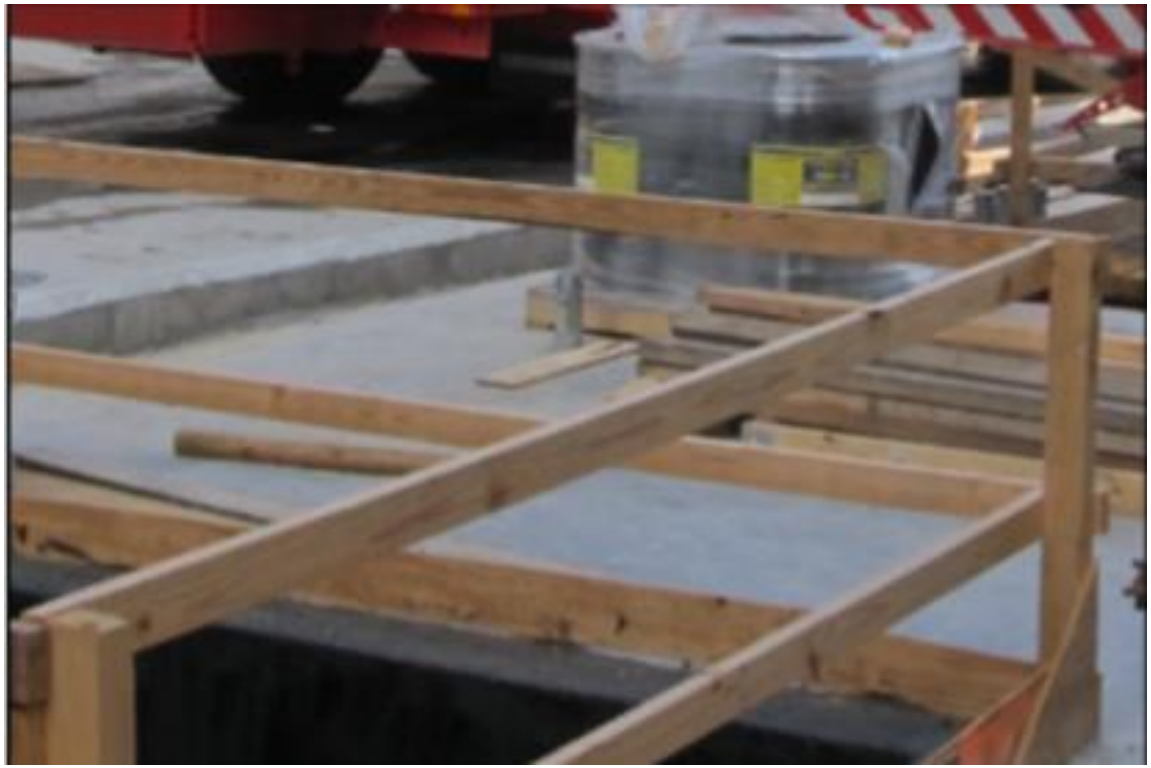
Maintenance

Guardrail systems must not have rough or jagged surfaces that would poke, cut or snag a worker's clothing.

Top rails and midrails must not cause a projection hazard by overhanging the terminal posts.

There shouldn't be any gap bigger than 1 inch measured along the perimeter of the building from the edge of the guardrail system to any building column or façade.

It should be secured so that it does not move during an impact or high winds.



Vertical Safety Netting

- Vertical safety netting must be installed and maintained to cover all unenclosed perimeters.

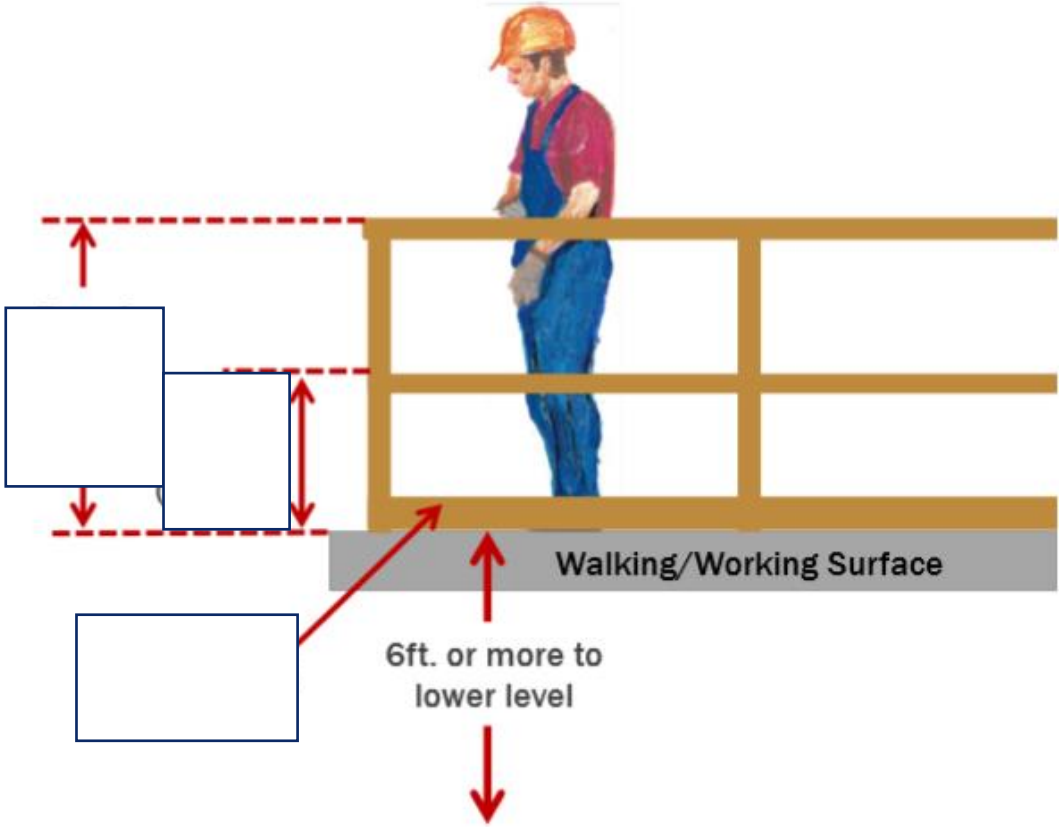
- Vertical safety netting must cover all openings at a height of at least 60 inches above the floor or the roof.

Vertical Safety Netting - Maintenance

- The largest opening area for debris netting when used vertically shall not be larger than 1 inch.

- Similar to guardrails, it must be kept as taut as possible to prevent any falls.

Drag and drop the label to the correct spot.



Top of Guardrail 42 inches

Midrail 21 inches

Toeboard 3 1/2 inches

SUBMIT

True or False

As long as it is sturdy, it is okay to lean against the guardrails.

- True
- False

SUBMIT

What type of materials can guardrails be made of?

Select all that apply.

- [ ] Plastic
- [x] Construction grade lumber
- [x] Non-corrosive wire
- [ ] Rope

SUBMIT

Which fall prevention equipment are included in an unenclosed perimeter protection?

Select all that apply.

- [ ] Personal fall protection system
- [x] Guardrail systems
- [ ] Safety monitoring systems
- [x] Vertical netting

SUBMIT

Knowledge Check

Let’s practice what we’ve learned in this module by going through this activity.

Miguel is here for another assignment. It looks like this time he will be working on scaffolds.

Help him make the right fall safety decisions so today goes smoothly.

Click the audio icon to hear Kacy speak.

On the way to your area, you see something that doesn't look quite right. Is there something wrong with this picture?

- (●) **Yes**
- ( ) **No**

Submit

What is wrong?

- There's no net.
- It's the wrong material.
- The toprail has sharp edges.
- There's no toeboard.

Submit

“Maybe we should tell someone”, Miguel says. Who should we tell?

- Qualified person.
- Competent person.
- Engineer.
- The erectors.

Submit

TBD

You keep walking and you see something else. What's wrong here?

- The guys are leaning on the rail.
- There's nothing wrong.
- It's not built correctly.

Submit

TBD

Image of workers leaning on railing.

You get to your assigned area and you notice that it is on the 2nd floor, about 10 feet off the ground. What should you do next?

- Talk to the competent person.
- Introduce Kacy to the other workers.
- Make sure that there is fall protection for both of you.
- Get to work.

Submit

TBD

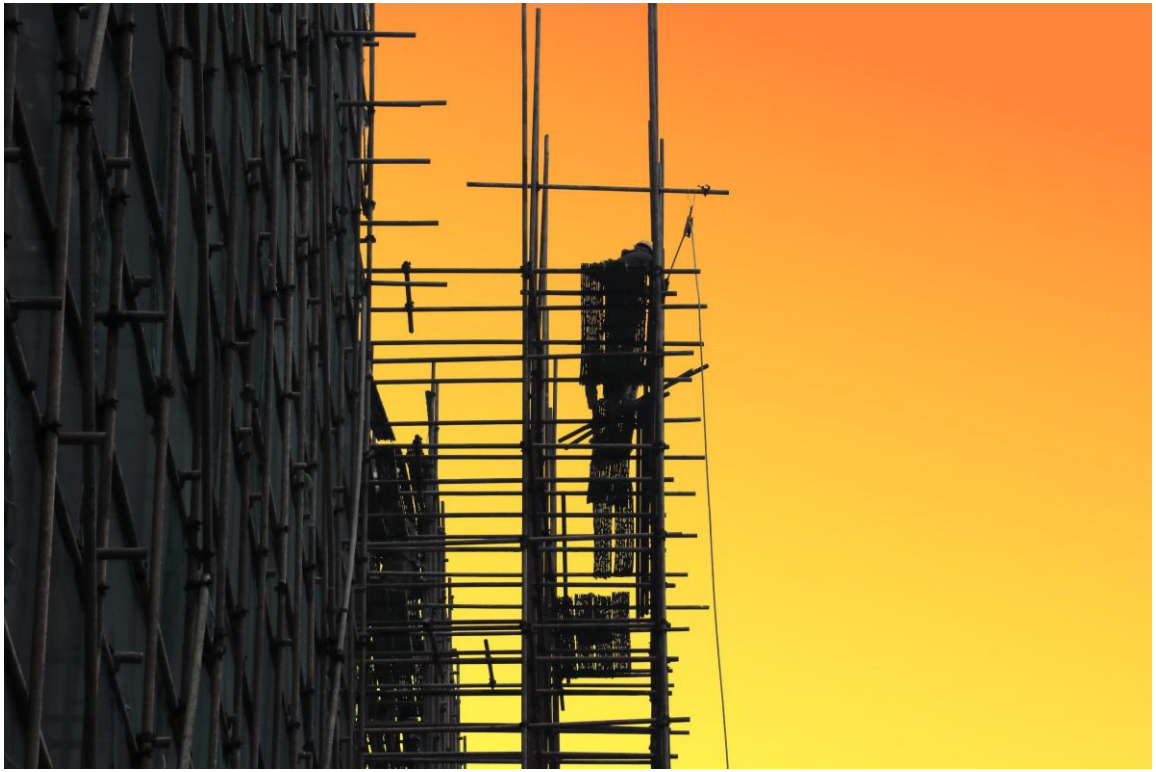
Image showing a floor with a height of 6 feet or more.

Across the way, you see another worker on a scaffold. What is wrong here?

Select All that Apply

- [ ] There's gaps in the planking.
- [ ] It is not 18 inches wide.
- [ ] There is more than 1 inch in between the planks.

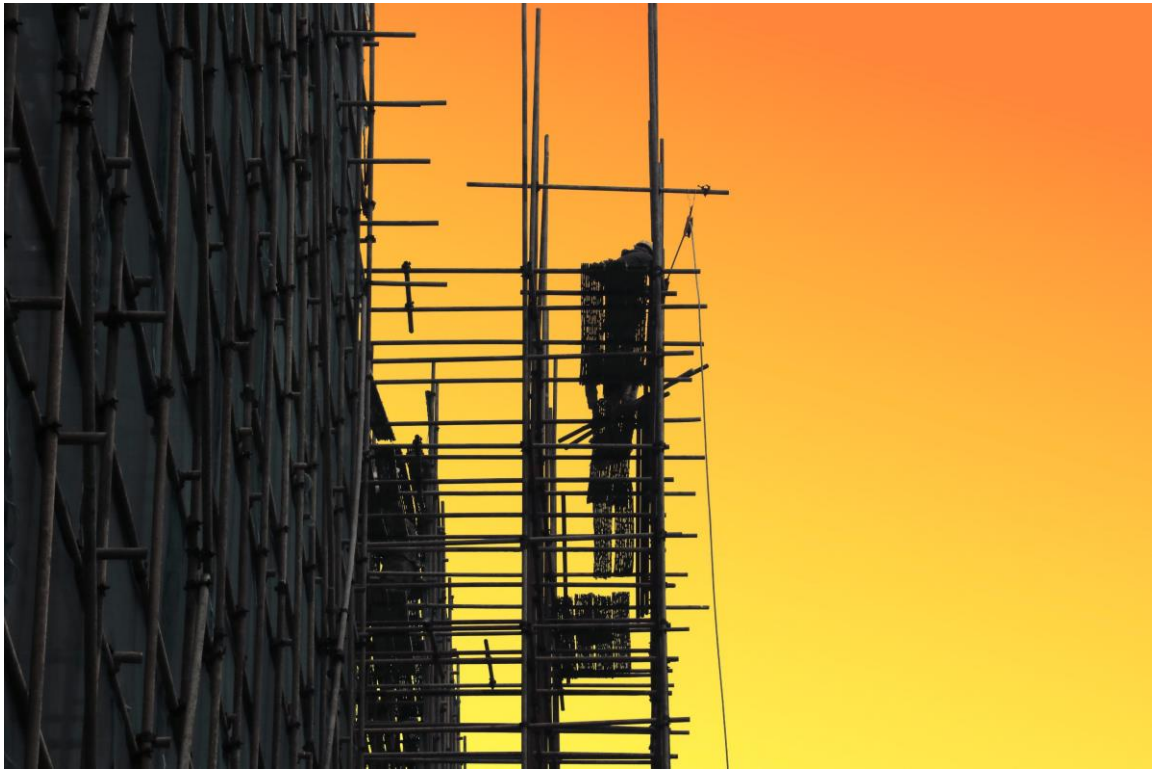
Submit



“Who’s in charge of designing the scaffold again?” Miguel asked.

- Competent person.
- Qualified person.
- Erector

Submit



You put on your fall protection gear. You're about to step onto the platform but you make sure to….

- Check your gear.
- Check for the scaffold inspection tag.
- Check what the other Workers are doing.

Submit

TBD

Image of a scaffold with an inspection tag (tag should not be front and center)

You see that it is a green tag.
What does this mean?

- Unsafe to work
- Caution
- Safe to work
- No such thing.

Submit

TBD

You step on the scaffold. Your last thing is to tie-off. Where should you tie-off?

- Gguardrails.
- To a nearby structure.
- The scaffold's structural component.

Submit

TBD

Knowledge Check

Great Job!!!

Another day safe and sound, thanks to you!

Click the audio icon to hear Miguel speak.

We’d appreciate your feedback.

Please take a moment to answer a few short questions about this course.

Start

How would you rate this course?

Submit

How do you feel after taking this course?

Great!

I’m feeling okay.

A bit overwhelmed.

Submit

How likely are you to recommend this training to a friend?

I won’t. I may. I will.

Submit

How could we have made this course better?

Submit

What did you like most about this course?

Submit

Thank you!.

We really appreciate your feedback and will take it into consideration for future improvements.

Continue

Thank you for completing

Fall Prevention: Module 2

Click here to confirm you have completed this course.