



Manitoba Home
Builders' Association

SCAFFOLDING AWARENESS

Facilitator Guide



Table of Contents

INTRODUCTION.....	1
Scaffolding Awareness Applications	2
Responsibilities.....	3
Employer Responsibilities	3
Worker Responsibilities	3
Workers Using Scaffolds	3
Module 1: Legislation.....	4
Did You Know?.....	4
Resources	4
Teacher Led Activity.....	4
Module 2: Different Types of Scaffolding	5
Types of Scaffolding Commonly used on Homebuilding	5
Did You Know?.....	9
Resources	9
Teacher Led Activity.....	9
Module 3: Assembly and Disassembly.....	10
Before erecting a scaffold, check the location for	10
Scaffold Foundation and Support	10
Scaffold Erection and Bracing.....	11
Scaffold Work Platforms	15
Scaffold Stability	18
Improper Point Loading or Overloading of Scaffold Platforms.....	18
Did You Know?.....	18
Resources	19
Teacher Led Activity.....	19
Module 4: Access and Egress	20
Fall Protection	20
Scaffold Access	20
Did You Know?.....	21
Resources	21
Teacher Led Activity.....	22
Module 5: Working on and Inspection of a scaffold	23

Have you identified the hazards?	23
Housekeeping.....	23
Inspection.....	23
What is the Live Load?	24
The Dead Load	24
Typical Loads and Requirements	24
Be Aware of Weather Conditions	24
Covers	25
Wind Uplift	25
Inspection.....	25
How is scaffold inspected?	26
Common Safety Concerns	26
Did You Know?.....	26
Resources	27
Teacher Led Activity.....	27
Glossary of Terms	29
Fall Protection App Usage	31
Game View	31
Module View.....	31
DEVELOPERS	31

INTRODUCTION

The Manitoba Home Builders Association in partnership with Manitoba Construction Sector Council received funding from Workers Compensation Board, Research and Workplace Innovation Program to develop an awareness course for scaffolding.

Scaffolds and ladders are commonly used on construction sites. Fatal or disabling injuries continue to result from workers falling from scaffolding that has been misused or poorly constructed on a construction site. The majority of the workers injured in scaffold accidents attribute the accident either to the planking or support giving way, or to the employee slipping or being struck by a falling object.

This course covers the basics of scaffold safety and is designed for tradespeople including drywallers, siding and stucco installers, welders, millwrights, painters, power engineers, masons, insulators, ironworkers etc. so they think safety when working on a scaffold. This resource would be an effective teaching tool for use in high schools, Apprenticeship programs or for tool box talks on the job site.

MHBA acknowledges that this project is supported by a grant from the Research and Workplace Innovation Program of the Workers Compensation Board of Manitoba.

Project Partners:

- Lanny McInnes Manitoba Homebuilders Association
- Brandy Dobson SafeCon Solutions
- Ross Jardine Construction Safety Association of Manitoba
- Mike Jones Construction Safety Association of Manitoba
- Ihor Barwinsky Gypsum Drywall Interiors Ltd.,
- Jeff Arnold Elite Communications,
- Cory Kloos Macanta Design Build Inc.,
- Jeff Sheldon Furnasman,
- Spencer Curtis Hilton Homes,
- Devin Penner, Red River Siding and Eavestrough
- Phil Fileccia Qualico from the Manitoba Home Builders Workplace Safety and Health Committee



Scaffolding Awareness Applications

- iOS:
<https://itunes.apple.com/us/app/mhba-scaffolding-awareness/id1351357767?mt=8>
- Android:
<https://play.google.com/store/apps/details?id=com.bsd.scaffolding>



Responsibilities

Employer Responsibilities

When scaffolding is used to complete work, an employer must:

- Develop safe work procedures for work involving the scaffold or elevated work platform
- Procedures are specific to each type of scaffold; ensure workers are trained appropriately on site and are briefed regularly
- Ensure workers comply with those procedures
- Include emergency response and rescue plans in case the scaffold/elevated work platform fails
- Appoint one or more competent persons to supervise the erection, installation, dismantling and removal of the scaffold system.
- Prime contractors should ensure scaffolding is erected and maintained according to regulatory requirements, manufacturer's specifications, and appropriate safe work procedures and engineers' designs are available on site.
- Ensure scaffolds do not bear loads greater than what they are rated for
- Workers are informed of their rated load
- Workers do not carry any materials or equipment while climbing a scaffold
- Ensure adequate overhead protection is provided for workers under the part of a scaffold that is being installed, altered or dismantled; or in situations where there is a risk of material falling on a Workers using scaffolds
- They must ensure any defective components are repaired or replaced before the scaffold is used. Ensure correct parts are used. They are not interchangeable
- Prime contractors should ensure scaffolding is erected and maintained according to regulatory requirements, manufacturer's specifications, and appropriate safe work procedures and engineers' designs are available on site.

Worker Responsibilities

- Workers must follow the safe work procedures developed for the workplace
- Use all necessary equipment and personal protective devices when erecting, installing, using and dismantling scaffold systems. This includes a hard hat, hi vis clothing and personal fall protection when required
- Wear safety footwear and headwear when installing and working on a scaffold system

Workers Using Scaffolds

Workers must follow the safe work procedures developed for the workplace and use all necessary equipment and personal protective devices when erecting, installing, using and dismantling scaffold systems. (Same as above)

Workers must wear safety footwear and headwear when installing and working on a scaffold system. An employer must ensure that a worker who installs, alters or dismantles a scaffold uses a fall protection system that meets the requirements of Part 14 (Fall Protection) of the Workplace Safety and Health Regulation. (Part 28)

Module 1: Legislation

Learning Outcomes

Students will be able to:

- Locate information in legislation on use of scaffolds in Manitoba
- Explain the minimum code and safety regulations for scaffold use in Manitoba
- Demonstrate safe work practices when using scaffold

Did You Know?

- You must follow minimum code for legislation.
- Legislation requires an engineer's stamp for a scaffold higher than 10 m.

Resources

- Main Resource: Guide for scaffolds and Other Elevated Work Platforms
https://www.safemanitoba.com/Page%20Related%20Documents/resources/4028_swm_scaffold_guide9.pdf
- Safe Work: Standards Summary Sheet ANSI Standard A10.8-2011 Safety Requirements for Scaffolding: Ladder-Type Scaffolds or Platforms
<https://www.safemanitoba.com/Resources/Documents/Standards%20Summary%20Sheet%20-%20ANSI%20A10.8-2011.pdf>

Teacher Led Activity

Download the document: [Standards Summary Sheet](#)

- ANSI Standard A10.8-2011 Safety Requirements for Scaffolding: Ladder-Type Scaffolds or Platforms
<https://www.safemanitoba.com/Resources/Documents/Standards%20Summary%20Sheet%20-%20ANSI%20A10.8-2011.pdf>

A. Ask students to locate the following information on the safety requirement document:

1. What does the weight on the scaffold include?

Answer: Workers, planks, platforms, support equipment

2. What is the weight capacity regulation for ladder jack scaffolds?

Answer: The weight on the scaffold cannot exceed the capacity of the scaffold.

3. What training do workers need to work on a scaffold?

Answer: Fall protection training/equipment use

4. How high can the ladder jack scaffold be?

Answer: 6.1 m or 20 ft.

5. What the minimum width of the planks?

Answer: Wood 18 inches or 45.7 cm
Fabricated material 12 inches or 30.5 cm.

Module 2: Different Types of Scaffolding

Learning Outcomes

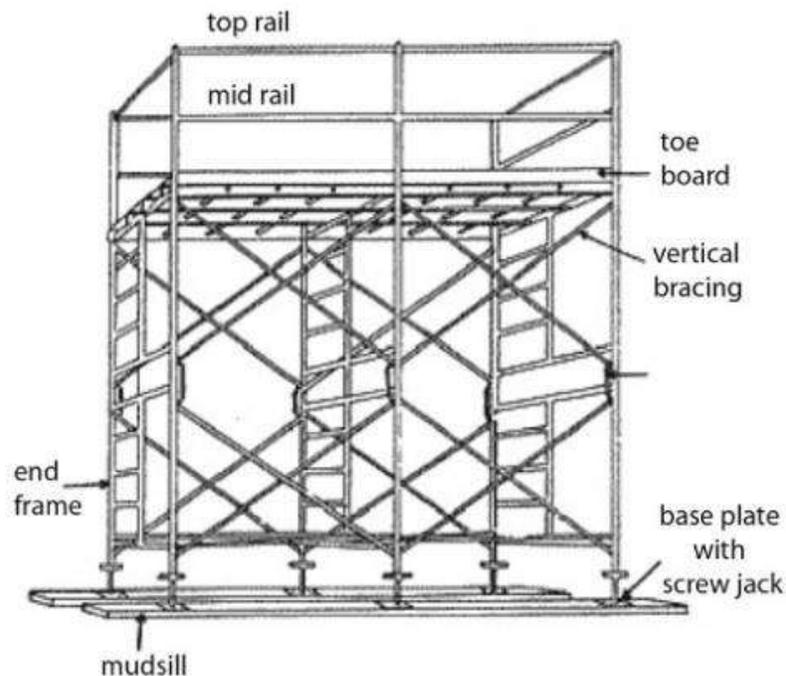
Students will be able to:

- Identify different types of scaffolding used in home building in Manitoba
- Name the parts of a scaffold used on a home building construction site
- Demonstrate how to safely move tools to the deck

Types of Scaffolding Commonly used on Homebuilding

Standard Tubular Frame Scaffold

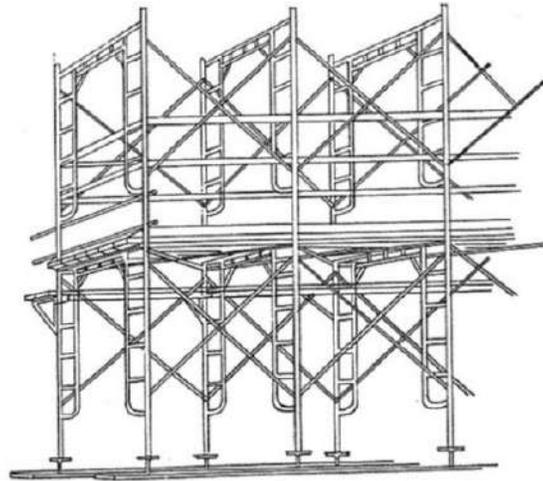
This is the most frequently used scaffolding system in Manitoba's construction industry. It is made of steel or aluminum tubing and manufactured in various designs and spans.



Walk-Through (Masonry) Frame Scaffold

A walk-through frame scaffold is a variation of the tubular frame type. It is frequently used in the masonry trade to provide greater height per tier, along with easier movement and distribution of materials on platforms.

Consideration must be given to pedestrian safety. All pedestrians must be protected from falling debris and materials.



Rolling (Mobile) Scaffolds

These scaffolds need to be moved frequently are often equipped with casters or wheels. Mobile scaffolds must only be used on firm, level ground. Once erected, the scaffolding must be stable. Mobile scaffolding must have casters or wheels that are equipped with suitable braking devices or be blocked to prevent the scaffolding from moving and rated to support the load imposed on it.

Small wheels are suitable for pavement or concrete floors. Larger pneumatic wheels are necessary where the ground is the working surface. When using pneumatic wheels, the load must be taken off the wheels with screw jacks and mudsill prior to use, because these wheels will be less stable than solid wheels. (It will cause the scaffold to go out of plumb when the workers get on it.) Rolling scaffolds must always be used on a surface that is firm, free of obstructions and level. Rolling scaffolds must always be used on a surface that is firm, free of obstructions and level. All brakes must be applied when the scaffold reaches the desired position.

Workers must get off a scaffold when it is being moved. You can't stay on and get pushed into a new position by a coworker or by yourself by pulling along the wall or ceiling.



Tube-and-Clamp (Coupler) Scaffolds

Tube-and-clamp scaffolds are often used for work on non-rectangular, curved and irregularly shaped structures. They work well where there are obstructions because they are infinitely adjustable in height and width.



Adjustable Scaffolds (Baker Scaffold)

Though lightweight and easy to use, adjustable height platform scaffolds are different from foldup scaffolds. They have a minimum number of components, making them easy to transport from job to job. They must be used on smooth, hard surfaces only. They are not designed to carry heavy loads.



Ladder-jack Scaffold

Ladder-jack scaffolding consists of a work platform mounted on jacks that bear on both the side rails and the ladder rungs of two extension ladders.

A ladder-jack scaffold must be designed and constructed as required by ANSI Standard A10.8, Safety Requirements for Scaffolding — American National Standard for Construction and Demolition Operations.

The ladders must not be spaced more than 2.5 m (8.2 ft.) apart. They must not exceed a height of more than five metres (16.4 ft) above grade, and a fall protection system is required for working at heights of more than 3 m (10 ft.). The jacks must bear on both the side rails and the ladder rungs, or the ladder rungs only, but only if the bearing area of each rung is at least 254mm (10 in.)

The ladder-jack scaffolding must be maintained as level as possible. No more than two workers are allowed to work on a ladder-jack scaffold at any time. Extension ladders must be secured from movement.

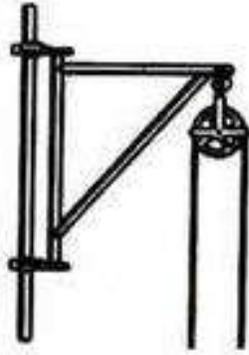


Hoisting Apparatus

Where scaffolds are more than 6 m (19.67 ft.) in height, they must be equipped with a suitable hoisting device. While materials can be pulled up by rope, it is easier to rig a pulley system to the scaffold so that hoisting can be done by workers on the ground. Ensure that you do not lift material in excess of the load capacity of the hoist system or scaffold connection or stand directly under the load while being hoisted.

A number of different mechanisms are used in hoisting the swing stage, including manual winches and powered swing stage hoists.

GIN Wheel Pully (ensure rope used is rated for load)



Manual Winches (Climbers)

Each set consists of a pair of smooth parallel jaws of suitable length that grip a wire rope firmly by closing top and bottom without causing damage to the rope. These jaws are self-clamping. They are locked by the pulling force of the wire rope itself. The greater the pulling force, the tighter they will grip. The jaw-blocks are enclosed in a casing and connected by rods to up-and-down mechanisms that are operated by a telescopic handle.

Be sure to check that the capacity of the winch, as rated by the manufacturer, is adequate for the load to be suspended.

Did You Know?

- Scaffolding used is specific to the type of project.
- Inside the home, rolling scaffold is used. Outside the home, standing scaffold is used.
- Residential work generally uses 1-3 sections of scaffolding.
- Uneven ground is common issue. Scaffold foundation is as important as a house foundation even though it is temporary. A mud sill or use of a longer leg is required on uneven or soft ground.
- If mud sills are doubled up (stacked), they must be nailed or screwed together

Resources

- Canadian Centre for Occupational Health and Safety: Rolling Scaffold Safety Fact Sheet: http://www.ccohs.ca/oshanswers/safety_haz/platforms/rollingscaffold.html

Teacher Led Activity

Draw a picture of a standard tubular frame scaffold. Identify each part of the scaffold.

Module 3: Assembly and Disassembly

Learning Outcomes

Students will be able to:

- Explain proper safety practices for assembling and disassembly of scaffolds
- Demonstrate how to erect scaffolds on uneven ground
- Follow the manufacturers guide for the set up and disassembly of scaffolds

Before erecting a scaffold, check the location for

- ground conditions
- overhead electrical wires
- obstructions
- variation in surface elevation
- tie-back locations and methods
- potential wind-loading conditions

Scaffold Foundation and Support

Scaffolds must be installed on surfaces that can adequately support the loads they apply. To support scaffolds, the ground must be well-compacted and levelled. Mud and soft soil should be replaced with compacted gravel or crushed stone. Embankments that appear unstable or susceptible to erosion must be contained.

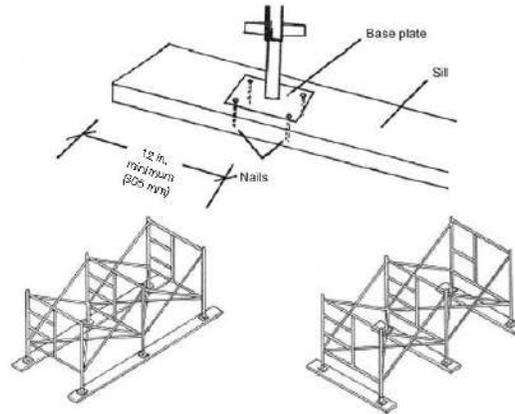
Scaffold sits on a mud sill to create even ground in muddy conditions. The sills (planks) must be continuous under at least two consecutive end frames or supports. A proper base plate is required under all circumstances. The base plate must rest centrally on the sill plate; the sill plate must project at least 305 mm (12 in.) beyond the scaffold foot ends.

Mud sills may be made from spruce, pine or fir (SPF) 2 x 10 planks. These will keep the scaffold legs from sinking into the ground causing the scaffold to tip over or collapse. The planks do not have to be pressure treated.

The use of blocking or packing, such as bricks or short pieces of lumber or scrap material, under scaffold base plates or sills is prohibited.

Take particular care when erecting scaffolds on frozen ground. Thawing soil is often water-soaked, resulting in considerable loss of weight-bearing capacity. Thawing is an important consideration where tarps or other covers will be placed around a scaffold and the enclosed area is to be heated.

Follow the manufacturers guide for set up and disassembly.



Scaffold Erection and Bracing

22 to 26 ft. is the average height of scaffolding. Scaffolds have a lot of weight just by them self without people and material on them.

Fittings and Accessories

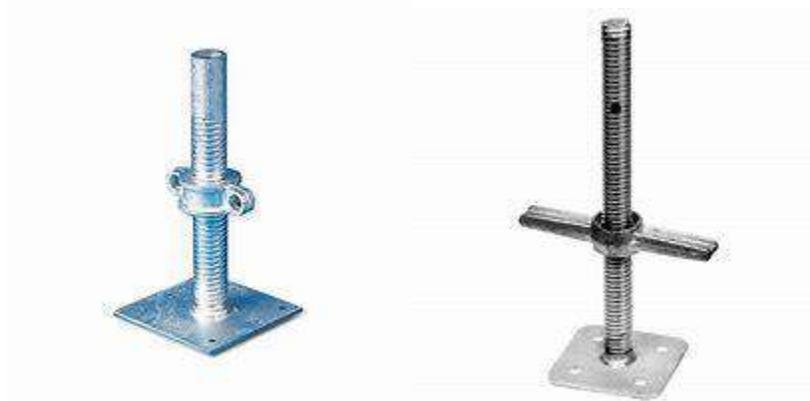
It is essential to install all the parts, fittings and accessories required for a scaffold so that it is installed according to the manufacturer's instructions. Ensure that all the components are in good condition and examine them to verify that they are not damaged. All fittings must be securely connected.



Base Plates and Screw Jacks

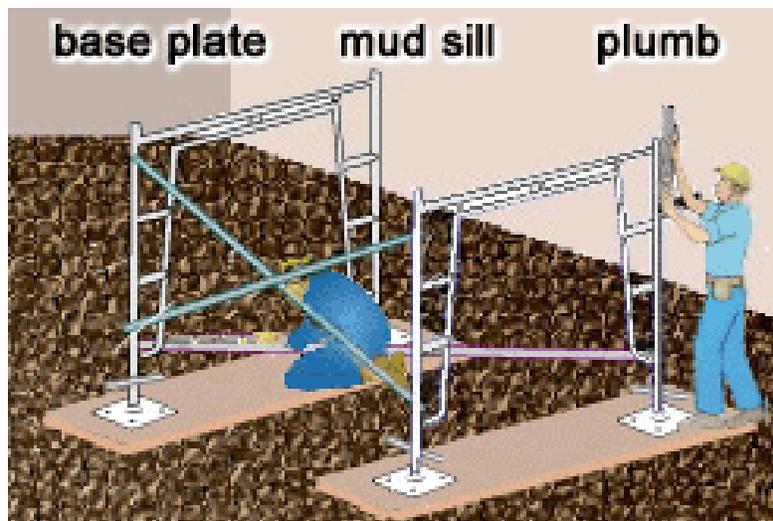
Base plates help distribute concentrated leg loads over a larger area. They also connect scaffold standards and sill plates. Base plates attach to scaffold legs with pins or locking devices. Workers erecting scaffolds often put screw jacks between the scaffold legs and base plates to allow the scaffold to be levelled. Base plates usually contain predrilled holes for attaching the plates to the sill plates. Use screws to secure baseplates.

Base plates must be used on all non-mobile scaffolding of a size and capacity specified by the manufacturer. Combination base plates with screw jacks must not be over extended; refer to manufacturer specifications.



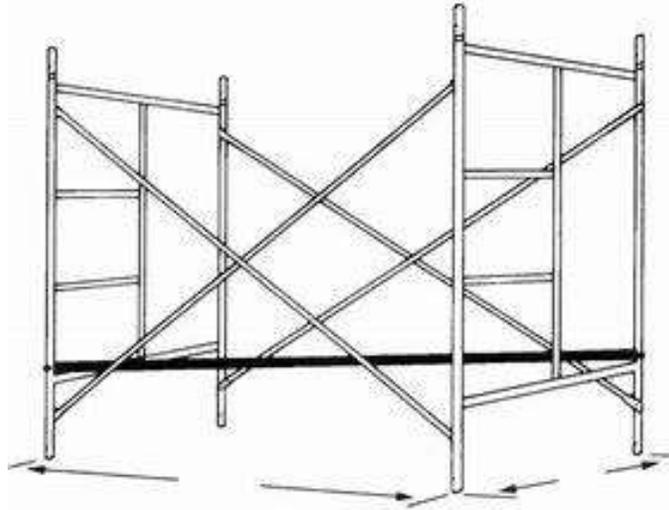
Plumbing and Levelling

It is essential that the scaffold is installed plumb and level to ensure the maximum structural capability of the system. When the first tier of scaffolding is installed, check for plumb legs and level decks, and continue doing so as the scaffold is built.



Bracing

This helps keep the scaffold frame plumb and square in both vertical and horizontal planes and provides stability against lateral movement. Once the frames have been fitted with adjustable base plates, the braces must then be attached for each tower span. The braces should slide into place easily. If force is required, the braces are likely bent or damaged, or the frames are out of plumb or square.



Coupling Devices

Every scaffolding manufacturer provides coupling devices to join scaffold frames together in the vertical plane. Coupling devices must always be used and installed properly at every joint as assembly proceeds.



These pins are often used

Wheels or Casters

If wheels or casters are used, they must be securely attached to the scaffold and equipped with brakes that are well maintained and easily applied. Make sure the ground is level and free of potholes and other obstructions where the scaffold will be located.



Dismantling

To dismantle a scaffold, reverse the installation procedure. Completely dismantle each tier and lower all material to the ground before proceeding with the tier below.

Workers must use a fall protection system that meets the requirements of Part 14 (Fall Protection) of the Workplace Safety and Health Regulation.

Guardrails

In Manitoba, on scaffolds where the platforms are 3 m (9.84 ft.) or more in height, open ends must have guardrails in line with the outer edges of the platform.



- ✓ Manufacturers of standard scaffolds have guardrail components that can be attached to the scaffold frames. Where these are not available, guardrails can be constructed from lumber or tube-and-clamp components.
- ✓ Guardrails must be constructed to resist a force of at least 900 N (200 lb.) applied anywhere on the guardrail.
- ✓ The top rail of a guardrail must be installed at least 900 mm (35.4 in.) high and not more than 1,060 mm (41.6 in.) above the working surface, with an intermediate rail installed between 450 (17.7 in.) and 530 mm (20.8 in.) above the working surface. The mid rail must have the same design capacity as the top rail.
- ✓ Toe boards must be provided where there is a possibility of materials falling from one working level to another. The toe boards need to be 125mm high, or a 1x6 on the edge can be used.
- ✓ Vertical cross bracing is not considered a guardrail and must not be used in such a manner.
- ✓ Tube-and-clamp guardrails may be constructed from standard aluminum scaffold tubing using parallel clamps to attach the vertical posts to each frame leg. Top rails and mid rails must be attached to the vertical posts.

Scaffold Work Platforms

The choice of a scaffold platform depends on the type of work being done. Before platform material is selected, determine the weight of workers, tools and materials to be supported by the decking.

Scaffold planks must extend at least 150 mm (5.91 in.), but not more than 300 mm (11.81 in.), beyond the end supports of the scaffold. If the planks overlap, the overlap must be centered directly over a vertical support of the scaffold, and the overlapping planks must extend at least 300 mm (11.81 in.) beyond the end supports of a scaffold.

Aluminum/Plywood Platform Panels

These platforms are pre-manufactured wood and aluminum decking with special fastening hardware. The manufacturer normally determines the load-carrying capacity and marks it on the platforms. Platform hooks and fastening hardware must be checked regularly for looseness, cracking and distortion.



Laminated Veneer Lumber

This material is a special type of exterior plywood rated by the manufacturer for scaffold use. The material is manufactured in large sheets of various thicknesses, which can be cut to the required size for different uses.

The planks must be inspected routinely. Planks showing de-lamination, fungi or blisters must be removed from service.

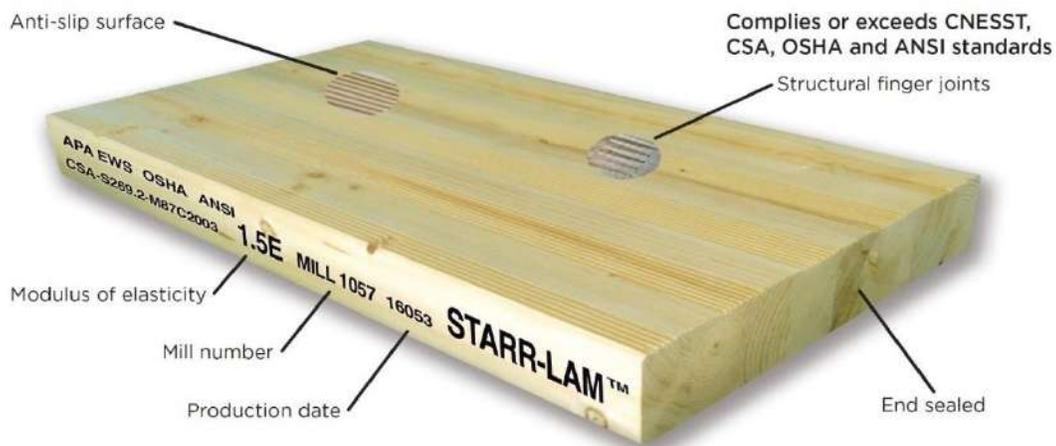


Sawn Lumber Planks

Scaffold planks must be examined before use on a scaffold and at regular intervals to ensure that the planks remain in safe condition. A jump test is not an acceptable method of inspection. Such methods can overstress the planks and cause undetectable damage.

Sawn lumber planks, 50 mm x 250 mm (2 in. x 10 in.) or larger, have been the standard scaffold platform material for many years. Planks are generally PR manufactured decking or the LVL's, laminated lumber.

Sawn lumber planks must be 5 m (16.40 ft.) or less in length and have the same thickness as the adjoining planks. They must be laid tightly together side-by-side with adjoining planks to cover the full width of the scaffold platform.



Planks

Wood planks are nominal size 50 mm x 250 mm (2 in. x 10 in.). They must be properly seasoned and free from bows, crooks, cupping or twisting.

Splits

Planks with splits wider than 10 mm (3/8 in.), or lengthwise splits closer than 75 mm (3 in.), to the edge of the plank, must be removed from service. When a lengthwise split in a plank exceeds half the length of the plank, then that plank must also be removed from service.



Plywood Cleats

Plywood cleats must not be used along the length of the plank to keep planks from splitting.

Wood Grain

The grain is not to exceed a slope of 1 in 12 along the length of the plank.

Knots

Knots must be sound, tight and spaced well apart. Maximum knot size for a 50 mm x 250 mm (2 in. x 10 in.) plank is 50 mm (2 in.) in diameter.

Dry Rot

Scaffold planks can also be weakened by dry rot. This condition is not easily recognized in its early stages, especially if the exterior of the planks is weathered. Planks substantially infected with dry rot are usually lighter than normal and must not be used.



Scaffold Stability

Three-to-One Rule: The ratio of unsupported height to least lateral dimension on a scaffold must not exceed 3-to-1, unless the scaffold is:

- tied to the structure at proper horizontal and vertical intervals
- equipped with outrigger stabilizers to maintain the ratio of 3 to 1
- equipped with anchored tie backs specified by a manufacturer or professional engineer

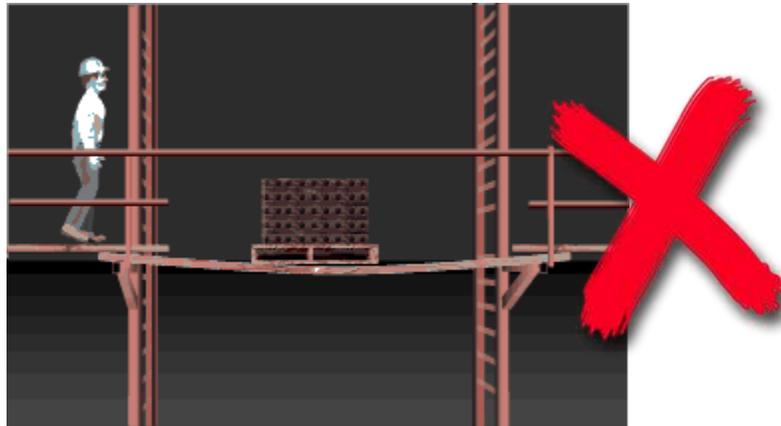
The 3-to-1 rule applies only to the extent that outriggers are extended symmetrically about the scaffold base.

Improper Point Loading or Overloading of Scaffold Platforms

Double planking on decks may be necessary where pallets of masonry materials are to be supported. Wherever possible, the pallets should be placed over the frame supports. In addition, planks used to support masonry materials must be inspected for damage or deterioration regularly.

Overloading may affect stability as well as load-carrying capacity. Differential settlement is often a problem where heavy loads are applied to scaffolds resting on loose or porous ground. Heavy loads should be placed symmetrically on the platform to ensure that soil settlement is uniform.

The scaffold structure must be able to carry intended loads. Be aware that the load-carrying capacity of scaffolding frames can vary with the height of the towers.



Did You Know?

- Pin and lock or tubular scaffolding is not more than 3 sections high.
- Guardrails and toe guards are often missing. These are important when working at heights.
- Always start from the top when disassembling the scaffold to do it properly.
- Do not use bent nails or wire in place of locking pins.
- Scaffold parts are not interchangeable.
- A cross brace will bend if the wrong cross brace is used on the scaffold. Refer to the manufacturers recommendations.

Resources

- Canadian Centre for Occupational Health and Safety: Platforms Framed Scaffold Components Safety Fact Sheet:
http://www.ccohs.ca/oshanswers/safety_haz/platforms/components.html
- Safe Work Manitoba, Wood Scaffold Planks:
https://www.safemanitoba.com/Page%20Related%20Documents/resources/bltn_134_swmb_oct_2014.pdf
- Canadian Centre for Occupational Health and Safety: Platforms- Decks Safety Fact Sheet
http://www.ccohs.ca/oshanswers/safety_haz/platforms/decks.html
- Canadian Centre for Occupational Health and Safety: Framed Scaffold Set Up Safety Fact Sheet:
http://www.ccohs.ca/oshanswers/safety_haz/platforms/setup.html
- YouTube Video: Safe Work BC, Some Ideas Are Ridiculously Dangerous: Scaffold Safety
<https://www.worksafebc.com/en/resources/health-safety/videos/some-ideas-are-ridiculously-dangerous-scaffold-safety?lang=en>

Teacher Led Activity

Identify some of the safety risks associated with scaffolding. You have been identified as a safety supervisor and your employer has asked you to write safety procedures on scaffolding for new employees. Develop a Tool Box Talk to hand out to the employees.

- Sample Tool Box Talk:
<http://safetytoolboxtopics.com/PPE/eye-protection.html>

Module 4: Access and Egress

Learning Outcomes

Students will be able to:

- Explain how to properly get on and off scaffolds (access and egress) to control hazards on the construction site
- Demonstrate safe work practices of access and egress on a scaffold

Fall Protection

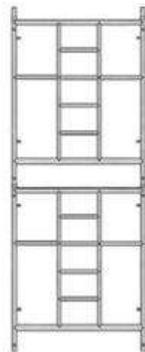
If a scaffold platform is 3 m (9.84 ft.) or more above a surface that a worker might fall to or less than 3m if a worker may land on a hazardous item like concrete rubble or other debris, machinery or equipment, employers must ensure that the platform has a guardrail on the outer edges of all open sides and ends.

Workers must use a fall protection system that meets the requirements of Part 14 (Fall Protection) of the Workplace Safety.

Scaffold Access

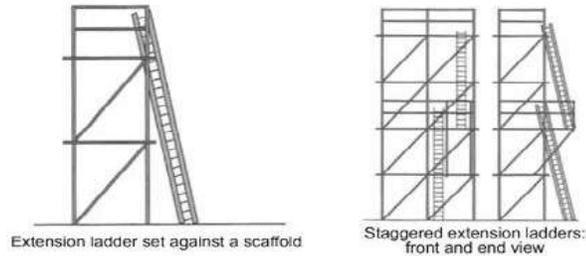
Climbing Frames (integral pre-fabricated access frames)

Only scaffolds with built-in ladders, designed and manufactured with rungs placed approximately at 12 in. centres may be climbed without a ladder. The alternative is to use a properly secured portable ladder or stairway.



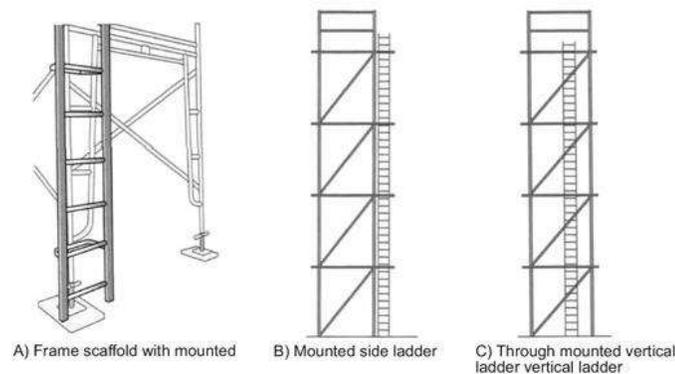
Portable Extension Ladders

Do not use an extension ladder against a scaffold unless the scaffold is secured from tipping over. The ladder cannot be used on a free-standing scaffold or it may tip over from the force produced by the ladder.



Stand-Off Vertical Ladders (Component Vertical Ladder)

Manufacturers make ladders designed to attach to scaffold frames or tubes using brackets. These ladder sections vary in length but must also be restricted to 3 m in height, unless a proper ladder climbing fall protection system is provided.



Did You Know?

- Workers are not to climb on the cross braces on the sides of a scaffold.
- New scaffolds have ladders that can be attached to the sides.
- Tools and material should not be in hand when climbing the scaffold, it is not safe.
- Trades people need to have a way to get larger tools onto the scaffold without taking them with them. Tools and material like this should be hoisted. Gunny bags work well for this.
- Often safety representatives see the deck bowed from the weight of a load. For example, workers may carry a bucket of mud. This mud adds considerable weight to the load. The correct decking needs to be used and needs to be inspected.
- Make sure the scaffold system used meets the required load including all the people on it, all the tools, and all of the materials.

Resources

- YouTube Video: Safe Work BC, Ladder Safety, Ladders on Scaffolds:
<https://www.worksafebc.com/en/resources/health-safety/videos/scaffold-ladder-improper-use-humourus?lang=en>
- Safe Work Manitoba, Fall Protection Guide:
https://www.safemanitoba.com/Page%20Related%20Documents/uploads/guidelines/fall_protection_updated_2011_web.pdf

- Canadian Centre for Occupational Health and Safety: Ladders-Portable Safety Fact Sheet
http://www.ccohs.ca/oshanswers/safety_haz/ladders/portable.html

Teacher Led Activity

- Handout Ladders-Portable
https://www.ccohs.ca/oshanswers/safety_haz/ladders/portable.html

Ask students to read the Ladders-Portable handout and develop a short play to stress the importance of ladder safety. It could demonstrate poor use of a ladder and then talk about what the worker was doing incorrectly. A video sample of the poor use of a ladder is below.

- YouTube Video: Safe Work BC, Ladder Safety, Ladders on Scaffolds:
<https://www.worksafebc.com/en/resources/health-safety/videos/scaffold-ladder-improper-use-humorous?lang=en>

Module 5: Working on and Inspection of a scaffold

Learning Outcomes

Students will be able to:

- Explain hazards associated with scaffold use
- Explain the care and maintenance of scaffolds to avoid damage to the equipment
- Explain the inspection process for scaffolds before, during and after use
- Explain how to inspect scaffolds

A lot of workers get hurt—and some get killed—every year in scaffold accidents. But the good news is, almost all scaffold accidents can be prevented by proper training.

Have you identified the hazards?

Scaffold safety training should begin with identification of the hazards. Common hazards include:

- Falls from elevation, due to lack of fall protection
- Collapse of the scaffold, caused by instability or overloading
- Being struck by falling tools, work materials, or debris
- Electrocuting, principally due to proximity of the scaffold to overhead power lines and faulty or damaged extension cords shorting out on the scaffold frame.

Housekeeping

Scaffold decks are usually small, narrow and confined. Tools and materials to be used should be stored in an orderly fashion. Debris and waste materials should not be allowed to collect on the platform. They should either be put in a container or removed from the platform immediately. Waste pieces of lumber, pipe, wire and miscellaneous metal and small tools are tripping hazards that have caused many falls from scaffolds. Working safely on scaffolds requires keeping an orderly work area.

Inspection

The employer must ensure that all scaffolding systems are inspected:

- prior to workers using them
- during periods of severe weather conditions
- Use a check list to document the inspection



What is the Live Load?

The total weight of the scaffold with worker, equipment, snow, wind, tarp.

The Dead Load

It is the weight of the people and equipment not including elements on the scaffold.

Typical Loads and Requirements

The intended load must always be considered when a platform is installed. To reduce the impact of point loading, all workers, including erectors, should always try to distribute loads uniformly on the scaffold, as shown below.

Double planking on decks may be necessary where pallets of masonry materials are to be supported. When doubling planks on decks they should be nailed or screwed together. Wherever possible, the pallets should be placed over the frame supports. In addition, planks used to support masonry materials must be inspected for damage or deterioration regularly.

Overloading may affect stability as well as load-carrying capacity. Differential settlement is often a problem where heavy loads are applied to scaffolds resting on loose or porous ground. Heavy loads should be placed symmetrically on the platform to ensure that soil settlement is uniform.

The scaffold structure must be able to carry intended loads. Both light-duty and heavy-duty frames are available on the market. If their load-carrying capacity is not known, consult the manufacturer or supplier and obtain the information before using frames. Be aware that the load-carrying capacity of scaffolding frames can vary with the height of the towers.

Be Aware of Weather Conditions

Do not work on a scaffold during certain weather conditions including lightning, storms and strong wind conditions, a huge factor in MB.

Covers

Some scaffolds are covered (hoarding) with tarps or other materials to enclose them against weather or to contain dust for operations like sandblasting. Scaffolds greater than 7.5 m in height must be designed by a professional engineer. Wind speeds, structure shapes and other variables can affect the design and erection of all covered scaffolding greater than 7.5 m (25 ft.) in height.

Where scaffolding is completely covered, adequate ventilation must be provided to ensure worker protection when heating, sandblasting or other procedures expose the worker to hazardous materials or agents.

Wind Uplift

Wind can lift lighter platform materials from the scaffold if they are not secured. Where severe wind conditions are anticipated or where high scaffolds are involved, platform materials such as aluminum/plywood panels should be secured to the scaffold. Some platform panels are secured with wires or nails. Some pre-manufactured systems incorporate locking devices.

Inspection

Some of the things to look for include:

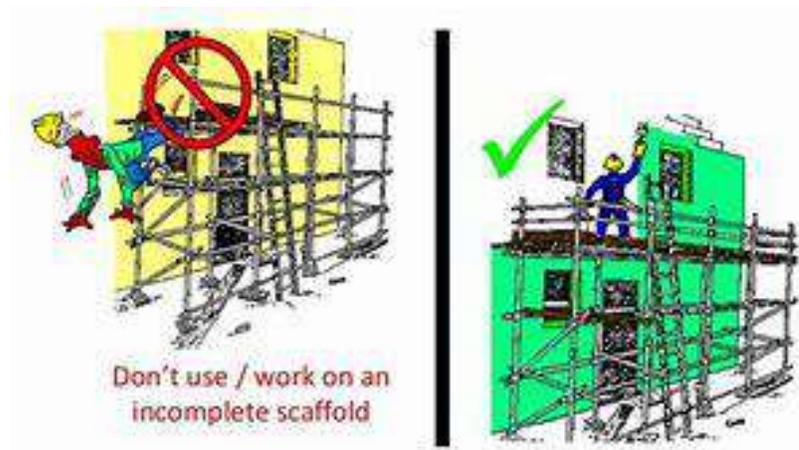
- damage to frames, braces and other structural components
- damage to hooks on manufactured platforms
- splits, knots and dry rot in planks
- de-lamination in laminated veneer lumber planks
- compatibility of components
- sufficient and proper components for the job
- • scaffolding that has been in place for a long time

Structural components that are bent, damaged or severely rusted must not be used. Similarly, platforms with damaged hooks must not be used. Planks showing damage must be discarded and removed from the site so they cannot be used as platform material.



How is scaffold inspected?

- Proper inspection of scaffolding includes pre-use, during and after use.
- When walking up to a scaffold, be able to identify what it is and do a visual safety inspection.
- A visual check is used. The use of a checklist is recommended.
- Be cautious when inspecting scaffold outside or on uneven ground.
- “Inspect before you erect” including a visual inspection of the decking.
- Make sure the scaffold is cleaned after use so it is free from building material and paint. Paint and building materials will hide any defects.



Common Safety Concerns

- erecting and dismantling scaffolds
- climbing up and down scaffolds
- planks sliding off or breaking
- improper loading or overloading
- platforms not fully planked or “decked”
- platforms without guardrails
- failure to install all required components such as base plates, connections, and braces
- moving rolling scaffolds in the vicinity of overhead electrical wires
- moving rolling scaffolds with workers on the platform
- Improper mud sills

Did You Know?

- Generally, people aren’t tied off on scaffold. There have to be guard rails and toe guards if a worker is not tied off.
- Workers should be certified in fall protection before working on a scaffold.
- It is a Workplace Safety and Health violation and an unsafe practice to ride on the scaffold.
- Homemade scaffolding is not accepted on a construction site.
- Scaffold use around the public requires precautions such as a hoarding (tarp/plywood/nets to cover the area and coloured tape.)

- When pins go missing, workers have replaced them with nails and zip ties. This makes the scaffold very unsafe.

Resources

- Canadian Centre for Occupational Health and Safety: Use of Scaffold Safety Fact Sheet:
http://www.ccohs.ca/oshanswers/safety_haz/platforms/scaffolduse.html
- Sample Inspection Checklist
yukonsafety.com/documents/3.ScaffoldInspectionChecklist.docx
- Safe Work BC, Scaffold Resources:
[https://www.worksafebc.com/en/search#q=scaffolding&sort=relevancy&f:language-facet=\[English\]](https://www.worksafebc.com/en/search#q=scaffolding&sort=relevancy&f:language-facet=[English])

Teacher Led Activity

Ask students to develop a hazard assessment for safe use of scaffolds on the site. Use the following template as a guide. A hazard assessment is required on all job sites as part of a company's safe work procedures. Invite a safety person to discuss the safe use of scaffolding and to review the job safety hazard assessment completed in class.

PRE-JOB SAFETY HAZARD ASSESSMENT

This form is to be completed and reviewed with your crew prior to any new work and Critical Task

Date: _____ **Job Address:** _____
Prime Contractor: _____ **Reviewed to Crew (Date):** _____

The intent of this pre-job instruction is to inform all involved with the task / job:

1. The procedures and safe work practices for use of scaffold on the work site are as follows:
2. All possible Hazards and Controls applicable to the use of scaffolding include:

Scope of Work - Task / Job to be done:

Items Reviewed (only check items applicable):

<input type="checkbox"/> Housekeeping	<input type="checkbox"/> Communication	<input type="checkbox"/> Environmental	<input type="checkbox"/> Fire Prevention
<input type="checkbox"/> Emergency Plan	<input type="checkbox"/> Electrical	<input type="checkbox"/> Lockout / Tag out	<input type="checkbox"/> Fall Protection
<input type="checkbox"/> Guardrails	<input type="checkbox"/> Access / Egress	<input type="checkbox"/> Ladders	<input type="checkbox"/> Tools
<input type="checkbox"/> Openings	<input type="checkbox"/> Hoisting	<input type="checkbox"/> Material storage	<input type="checkbox"/> Signals
<input type="checkbox"/> Unloading and Loading of Materials			

Controls:

<input type="checkbox"/> Hardhat	<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Footwear	<input type="checkbox"/> Fall Protection
<input type="checkbox"/> Hearing Protection	<input type="checkbox"/> High Visibility Vest	<input type="checkbox"/> Cut Proof Clothing	<input type="checkbox"/> First Aid
<input type="checkbox"/> Fire Extinguisher	<input type="checkbox"/> Harnesses / Lanyards	<input type="checkbox"/> Specialty Equipment	

Site Specific Hazards	HR	Site Specific Controls

HR: **A** – Extreme Hazard **B** – Moderate Risk **C** – Low Risk
D – OK **E** – N/A

Is a critical lift required on site?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
If	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
Yes:	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
▪ Have you reviewed the Log Book?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
▪ Has the operator shown certification?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
▪ Who is a qualified signalman being used?	_____			

By signing below you are acknowledging discussion and understanding of all items checked and or written above and equally accountable

Print Name:	Signature:
_____	_____
_____	_____

More signatures put on the back of this form.

Management	Safety Coordinator
-------------------	---------------------------

Glossary of Terms

Aerial Lift

A vehicle-mounted aerial device used to elevate personnel to job sites above ground.

Base Plates

Devices used to support and distribute the vertical leg load of a scaffold system over a large area of a sill and sized according to the manufacturer's specification.

Bracing

A system of members connecting frames or sections of scaffolding to make the scaffold structure while adding strength and rigidity between members.

Bracket Scaffold

A platform supported by two or more triangular brackets projecting out from a building or structure to which the brackets are securely fastened.

Checking for Plumb

Ensuring the scaffold is balanced and erected at a 90-degree angle straight up from a level surface.

Competent

Possessing knowledge, experience and training to perform a specific duty.

Coupling Devices

A connecting device used to secure scaffold frames together.

Engineering Design

The design of a scaffold system by an engineer licensed to practice in Manitoba. The sealed drawings of a scaffolding system should include all appropriate information on loading capacities and detailing on tie-backs, foundations, etc. These drawings must be kept on site.

Fall Arrest System

A protection system designed to stop a worker's fall before the worker hits the surface below, usually consisting of a full body harness secured to a lanyard and lifeline.

Foundation

The surface upon which a scaffold is erected.

Full Body Harness

A device consisting of connected straps designed to fit the torso and pelvic area of a worker, with provision for attaching a lanyard, lifeline or other component.

Guardrail

A rail secured to uprights and erected along the exposed sides and ends of platforms. Part 14 of the WSH Regulation stipulates that the minimum height of the guardrail shall be 900 mm (3 ft.) and the maximum 1060 mm (3.5 ft.). The guardrail should be wood or metal, but not a bracing component.

Ladder-jack Scaffold

A platform supported by brackets attached to ladders.

Lanyard:

A flexible line of webbing, synthetic fiber or wire rope used to secure a full body harness to a lifeline or anchor.

Lifeline

A flexible synthetic line or rope made of fiber, wire or webbing rigged from one or more anchors to which a worker's lanyard or other part of a fall protection system is attached.

Mud Sill

A building support located at or below ground

Mobile Scaffold

A free-standing scaffold equipped with casters or wheels at the base.

Outrigger Scaffold

A platform that is supported by rigid members cantilevered out from the building or structure, or from vertical supports.

Outrigger Stabilizers

A device used to extend the support length at the base of the scaffolding in order to provide stability against overturning.

Planks

Refers to sawn lumber, 50 mm x 250 mm (2 in. x 10 in.) or wider, used in creating scaffolding platforms. All lumber dimensions are nominal.

Platform

A working surface provided on a scaffold to support the weight of workers, tools and materials.

Pump Jack Scaffold

A scaffold consisting of vertical poles, platform planking and movable platform brackets that travel on the vertical poles.

Sills

A footing of minimum 50 mm x 250 mm (2 in. x 10 in.) wood plank or other device used to distribute the load from a vertical support or base of a scaffold to the ground.

Suspended Scaffold

It is one or more platforms suspended by ropes or other non-rigid means from an overhead structure.

Tie-in

A reinforcing connection device that secures a scaffold to a fixed structure.

Toe Board

A barrier secured along the sides and ends of a platform to help stop materials or tools from falling.

Tubular Frame Scaffold

A work platform supported by welded tubular frames, cross-braces and accessories.

Fall Protection App Usage

The application is designed to be used on tablet devices. Both Android and iOS tablets are supported. Once the application is downloaded from the store it can be launched by tapping the icon on the home screen. The experience is split into 2 main pieces.

Game View

The game view is where the user interacts with the game objects and needs to perform specific actions:

- The user can select the level they would like to play from the level select screen
- The user is given direction from their supervisor on the site and asked to assemble or disassemble scaffolding.
- If the user performs the action incorrectly they are told to review in the module view.
- Once the action is complete the user can review the work and move onto the next level.

Module View

The module view contains all the educational content which is described within this facilitator guide. The user chooses a module from the left-hand pane and is presented with various types of content:

- Text content
- Video content
- External resources (links to legislation)
- Imbedded PDFs

Note: The user will require a network connection for external resources to load. Game content within the app does not require a network connection.

DEVELOPERS



