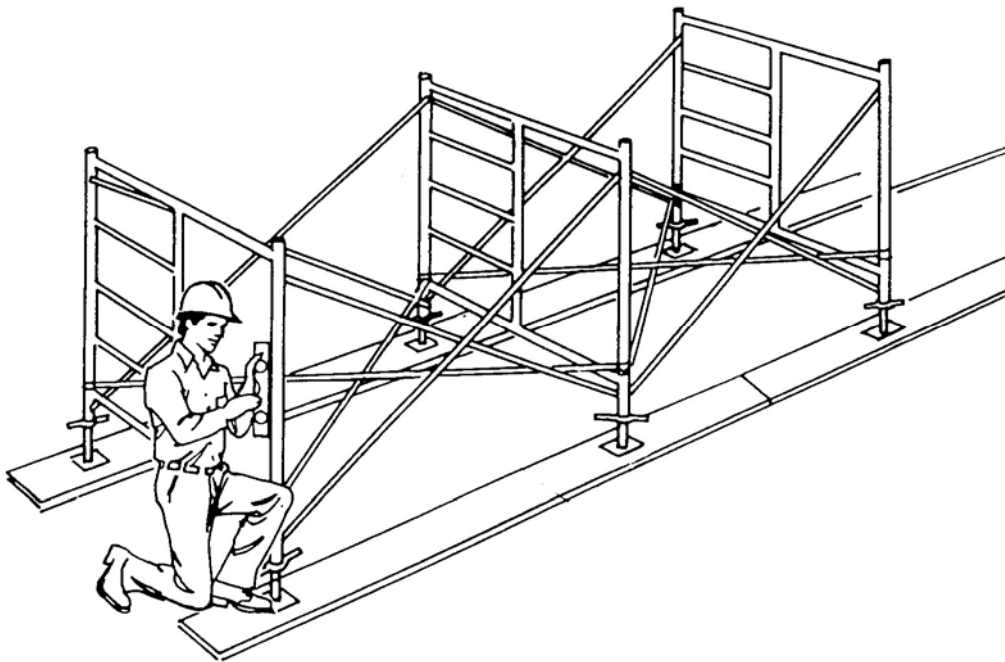




CONSTRUCTION SAFETY EDUCATION PROGRAM

#5 Part 1

FRAME SCAFFOLD SAFETY



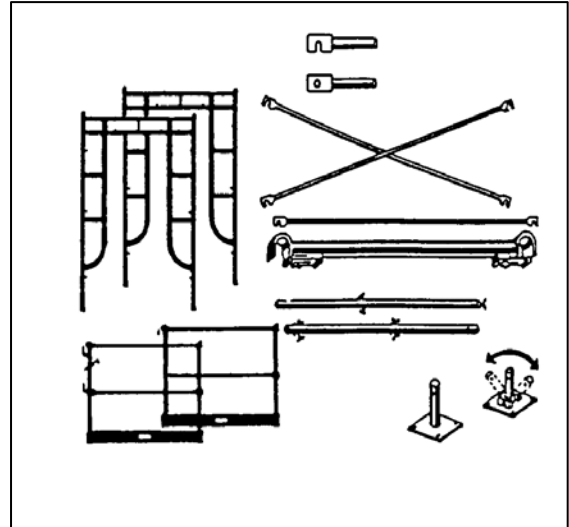
This education program provides a guideline for scaffold safety. It is intended to give contractors and workers practical information relating to the requirements of working safely with scaffolding.

This education program contains general information. For specific regulatory requirements, please consult the appropriate Workplace Safety Health Act & Regulation adopted under the Workplace Safety and Health Act, the Canadian Standards Association (CSA) Standards, and the Manitoba Guidelines for Access Scaffolding.

FRAME SCAFFOLD SAFETY – PART 1

INTRODUCTION

- A scaffold is a temporary structure usually made of metal tubing, which provides support for workers and materials used in construction, maintenance, repair, and demolition work.
- A scaffold is a valuable aid to construction work as it enables us to perform many jobs which would otherwise not be possible.



- Scaffolding was intended to be a safety aid however; it remains one of the more serious problem areas in construction due to a high frequency and severity of incidents. More than 50% of these injuries are due to falls.

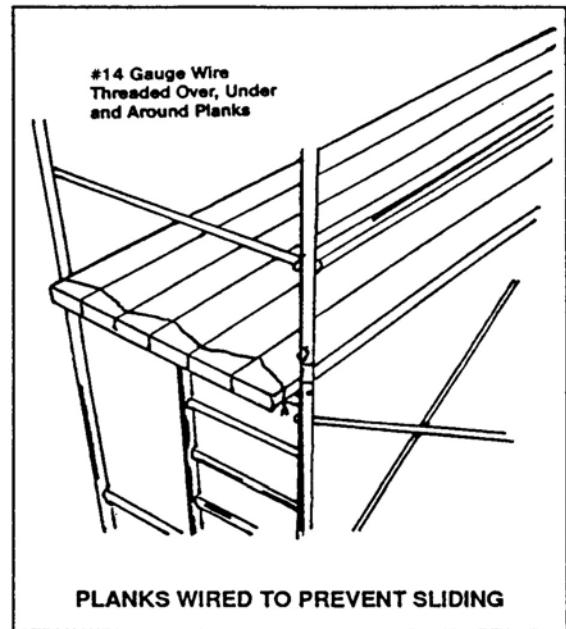
GENERAL SAFETY REQUIREMENTS

- Preventing job site scaffold incidents begins with planning and selecting the right scaffolding system for the job. This is usually an employer's responsibility which requires a basic knowledge about site conditions and the type of work to be done, i.e. masonry work, sandblasting, painting, siding, mechanical installations, etc.
- Other factors to be considered in the planning stage include the weight of workers, tools, materials and other equipment to be carried by the scaffold, the type of floor, i.e. concrete or mud, the condition of walls and anchorage points, height, weather conditions, duration of work and possible requirements for public safety.
- Because there are scaffold frames with different load rated capacities available for sale or rent in the marketplace it is important to ensure that the scaffolding delivered to the site meets the demands of the job.

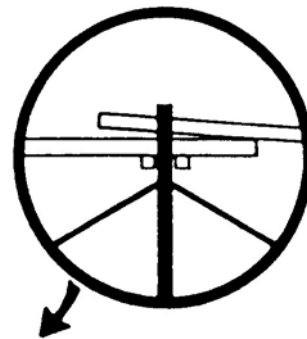
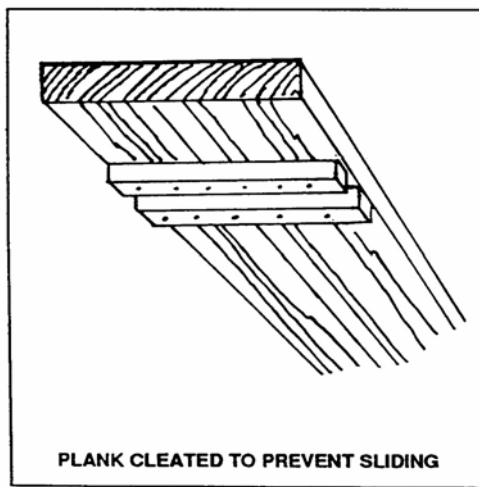
- **Workplace Safety Health Act & Regulation requires that all commercially manufactured scaffolds and their components, footings or sills, to have a safety factor of 4.** A scaffold with such a rating is capable of supporting a load 4 times greater than its rated capacity when properly assembled with all braces and fasteners in place. The safety factor must be maintained and it is a contravention of the Workplace Safety Health Act & Regulation to load a scaffold beyond its rated capacity.
- In addition to the above, the **Workplace Safety Health Act & Regulation requires the employer to have a professional engineer design and certify the specifications of every scaffold which will be erected to a open access height of more than 10m also an enclosed or hoarded access scaffold of more than 7.5m in height. An engineer's approval may also be required by a provincial Workplace Safety and Health Officer under circumstances where the officer is of the opinion that such approval is necessary to ensure the safety of the structure.** Copies of all such engineer's approvals must be kept at the site and be made available to a Workplace Safety and Health Officer on request.
- Even the most thorough planning and the best scaffold components available will not guarantee a safe incident-free job. Job site errors are typically the major factor involved in most scaffold related injuries and well trained safety conscious workers and supervisors are the key to preventing these injuries and ensuring safety and efficiency on the job site.
- **The Workplace Safety Health Act & Regulation requires the employer to ensure that all commercially manufactured scaffolding is erected, used and maintained in accordance with the manufacturer's specifications and further they specifically state that the employer must appoint a trained and experienced worker to supervise the erection, dismantling, and removal of a scaffold.**
- Some of the main problem areas associated with the use of scaffolding on job sites is discussed in this program in the following order. The program has been divided into two parts as some may prefer to deliver it over the course of two 30 minute sessions.
 1. Work platform and planks
 2. Failure to install all required components
 3. Climbing up and down
 4. Failure to install guard rails
 5. Working from unprotected platforms

WORK PLATFORMS & PLANKS

- The biggest problem associated with erection is the failure to provide an adequate working platform from which to install the next lift of scaffolding. Working from one or two uncleated, unsecured planks is not recommended.
- Working platforms should always be fully decked to help prevent planks from sliding sideways along the width of the scaffold. Wiring the planks together as shown provides an extra margin of safety. However, care must be taken when installing the wire so it does not present a tripping hazard.
- Movement of the planking can also cause serious injury. Sawn lumber planks should be cleated on at least one end to prevent movement along the length of the span.



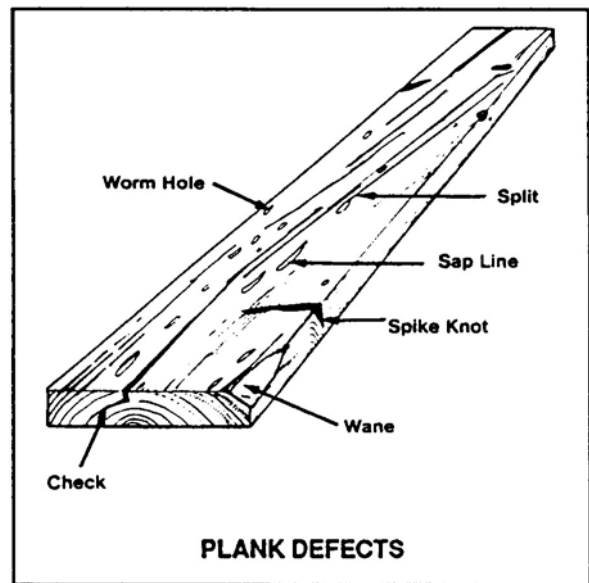
Where Multispan scaffolding is being used the planks should be overlapped so that the cleated end is resting on the scaffold support.



- The scaffold planks themselves are another critical item. It's a fact that they do occasionally break. Therefore it is important to use only the proper size and grade of lumber and to inspect planking before each scaffold erection.
- **The Workplace Safety Health Act & Regulation specifies that wooden scaffold planks must be 5m or less in length and have the same thickness as the adjoining planks. They are to be constructed of nominal 50 mm. X 250 mm. construction No.1 grade lumber. (2" x 10).** It's important to remember that the Workplace Safety Health Act & Regulation is the minimum requirement and for some jobs it may be necessary to use a better grade of lumber. Dressed or smooth lumber is not as strong as a true 2 x 4 as it measures only about 38 mm. x 235 mm. (1 ½" x 9 ½").
- If the platform consists of wood planks, the Workplace Safety Health Act & Regulation states that the scaffold must have vertical supports for the planks at least every 2.5m.
- The Workplace Safety Health Act & Regulations are non-restrictive in the sense that they do not specify that a particular species of lumber must be used for planking purposes. Virtually any species would be acceptable if it could be proven that the planks in question were capable of supported the intended load with the required safety factor and met the above mentioned minimum specifications regarding dimensions.
- Douglas fir is one of the most widely used species of wood used to scaffold planks because of its inherent strength and other characteristics such as grain and clarity or freedom from knots.
- Structural grade spruce-pine-fir species group (SPF) for scaffold planks is also widely used in some areas where Douglas fir is relatively scarce as it is capable of supporting almost as much weight.
- For other lighter jobs No. 1 Grade SPF planks may provide adequate service provided that they are not loaded beyond their limits.
- If there is ever any doubt about the load carrying ability of scaffold planks a professional engineer should be consulted for assistance.
- Another equally or perhaps even more important safety aspect which is often neglected on a formal basis is inspection. Planks often deteriorate quickly with use and age and are subject to damage. **The Workplace Safety Health Act & Regulation requires the employer or the supervisor designated to supervise the erection of the scaffold to inspect all components of a scaffold prior to use and cause any faulty components to be immediately repaired or replaced.** If the scaffolding is owned by the

employer it may be more convenient to conduct an inspection at the yard prior to delivery to the site. If the scaffolding is rented the inspection should be done at the site.

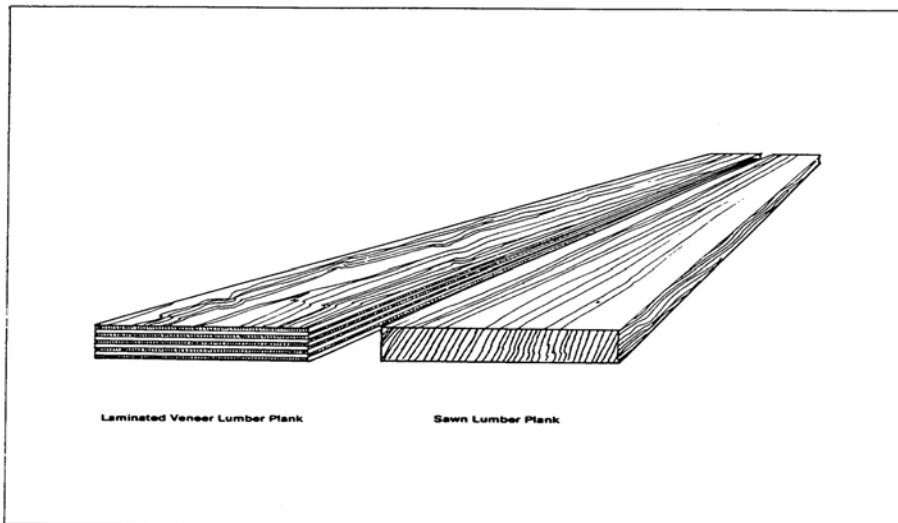
- Don't rely on others to inspect your scaffolding or guarantee your safety and the safety of your fellow workers. Insist that a trained individual from your firm does the inspection. Some common defects to be on the lookout for are illustrated and described in the diagram on the right.



1. **Checks** – lengthwise crack or separation occurring across annual rings. No such splits or cracks are permitted within three inches from the edge of the plank and planks with splits wider than 10 mm. (3/8") must be removed from service.
 2. **Shakes** – lengthwise separations along the grain, the greater part of which occurs between the annual rings.
 3. **Wane** – the bark or lack of wood from any cause on the face of a piece.
 4. **Knots** – must be sound, tight, and well spaced. The maximum allowable size for the wide face of a 2" x 10" plank is 50 mm. or 1 7/8". For 2" x 12" planks the maximum is 60 mm. or 2 3/8". On the edges there should be no knots larger than 10 mm. or 3/8" in the middle third of the plank. Planks with spike knots should be rejected.
- Planks can also be weakened by a condition known as **dry rot**. This condition is not easily recognized in its early stages especially if the exterior of the planks has been weathered. However, **planks which are substantially infected are usually lighter than sound planks of similar size and species**. For this reason, planks which appear to be lighter than normal should not be used.

- Alternatives to sawn lumber planks are becoming more popular and each has its own advantages and disadvantages. Two of the most common of these are described below.

Laminated Veneer Lumber platforms – although made of wood this material is stronger than some sawn lumber for regularly used scaffold plank species and sizes. This material does not warp, crack or split as easily as wood planks but it tends to be heavier than similarly sized sawn lumber planks.



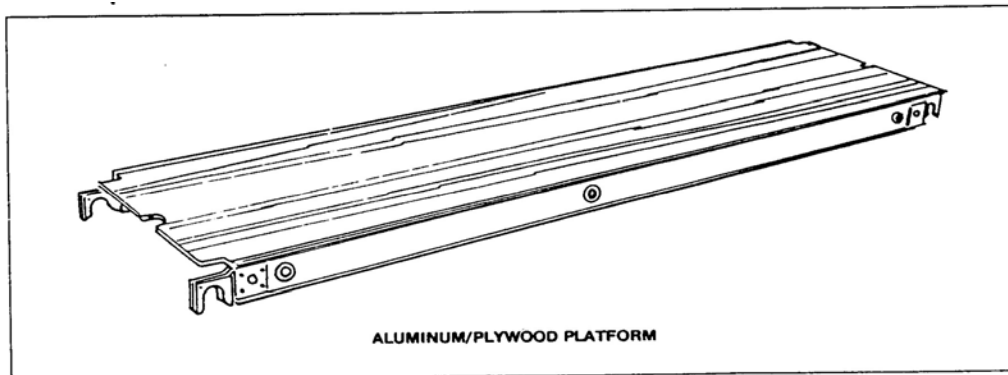
- Aluminum/Plywood Platforms – these are generally lighter and wider than planks, therefore they are easier to handle and fewer are required to fully deck a platform. Although load capacities vary with manufacturers most are capable of handling the loads of average construction work. They are normally not designed for heavy loads such as pallets of masonry material. When used outdoors these platforms must be secured to the frames. Otherwise, when unloaded, they can be blown off the scaffold by strong winds.

A SPECIAL NOTE...

The platform hooks and fastening hardware used on these types of platforms must be checked regularly for looseness, cracking, and distortion. As a result of several incidents in Alberta it was learned that structural cracks developing near the hook assembly led to platform failures. The cracks apparently occurred as a result of abuse during handling.

- Due to the possibility of this occurring all Manitoba workplaces using this type of aluminum extrusion section must implement and adhere to a rigid inspection program which includes:

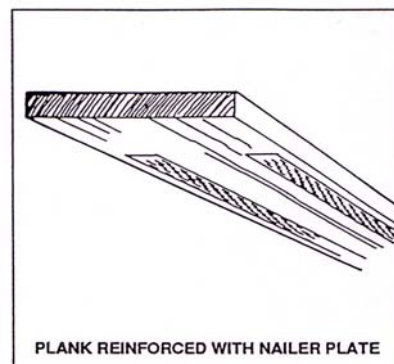
- permanently identifying planks
- maintaining records of service histories, and completed inspection reports
- conduct thorough inspections prior to each installation



- have any repairs certified by a professional engineer prior to putting the plank back into service.
- Overloading is another major cause of plank failure and serious injury. It is important to know that **the load carrying capacity of a scaffold plank varies with the scaffold span length, the size, and the location of the load.** Double or even triple planking may be required in some cases. Light duty platforms with less capacity are not recommended for construction purposes.

Remember:

- Number 1 construction grade lumber 2 X10 planks are required.
- Planks must be free of cracks.
- Safety factor of at least 4 times the maximum load is required.
- Wood planks may be reinforced with metal nailer strips to increase their strength. However these strips should only be used on planks which are the proper grade to start with. They are not recommended as a method of upgrading inferior planks for scaffold use.



The advantages of strengthening planks by this method are two-fold.

- 1) Planks are not as likely to be cut up or used for purposes other than scaffold planks.
- 2) Additional assurance is provided against defects undetected in the grading process which may cause the plank to break prematurely causing an incident.

PLATFORMS

Platforms: secured and minimum width:

28.9(1) An employer must ensure that a scaffold platform is secured to prevent movement and is at least:

- (a) 500 mm wide nominally; or
- (b) 1.5 m wide nominally, if it is used by workers who are bricklayers, stonemasons, plasterers or a similar trades people, and the scaffold is used to hold their immediate supply of building materials.

28.9(2) Despite clause (1)(a), where a scaffold platform forms part of a lean-to scaffold and consists of a commercially manufactured plank, the platform must be at least 400 mm wide.

FRAME SCAFFOLD SAFETY – PART 1
REVIEW QUESTIONS

NAME _____
DATE _____

FILL IN THE BLANKS WITH THE CORRECT ANSWERS

1. All commercially manufactured scaffolds and their components, footings, or sills must have a safety factor of _____.
2. A professional engineer must design an open access scaffold which will be erected to a height in excess of _____.
3. To help prevent planks from sliding sideways along the width of the scaffold, working platforms should be _____.
4. To prevent movement along the length of the span, sawn lumber planks should be _____.
5. The minimum requirement for lumber used as scaffold planks is _____ grade which measures _____ thick and _____ wide.
6. The Manitoba Workplace Safety Health Act & Regulation requires prior to use, the scaffold must be inspected by a _____.
7. Four plank defects which may be cause for rejection of a plank are: _____, _____, _____ and _____.
8. _____ is a disease which weakens planks.
9. Adequate Fall Protection must be used if the scaffold is higher than _____ feet.