



## ***Welcome to the safe@work Building and Construction Module***

Have you read the General Module, completed the test and printed your safe@work General Award of Attainment?

The Building and Construction Module should be done **AFTER** the General Module.

If it is some time since you have completed the General Module you should read the Review Module. The test for this module contains some questions based on the Review Module.

There are common hazards that exist in the building and construction industry. It is important to learn about these hazards and how they can be controlled so that people at work are not exposed to risk.

The Building and Construction Module contains information on:

- Prevention of Falls
- Machinery and Equipment
- Electricity
- Hazardous Substances and Dangerous Goods
- Manual Handling
- Noise
- Sunburn and Heat Stress, and
- Job Safety Analysis.

Construction sites are temporary, and change constantly as work progresses and different construction employees and equipment arrive on site. A site that is safe one day may not be safe the next, so you must pay attention to the hazards and their potential risks at all times.

The rate of injury in the construction industry is higher than in most other industries. The most frequent causes of death and severe injuries are falls from height, falling materials and collapses, electricity and mobile plant.

Within the building and construction industry you may be exposed to a range of work activities such as:

- setting up simple working platforms and temporary power sources
- safe operation and maintenance of equipment including hand tools and portable power tools
- taking measurements and site levels
- performing site calculations
- preparing sites and pouring and finishing concrete pads
- working with internal partitioning, and
- other trade services like plastering, painting and tiling.



**Key Point**

Your employer should make sure equipment is well maintained, that you are properly trained and supervised, and given instructions for safe work procedures.

Where the risks cannot be eliminated, or to improve the level of protection, your employer must also provide personal protective equipment (PPE) such as a safety helmet and safety boots or shoes with reinforced steel toecaps.

**Key Point**

You must follow safe working procedures and wear the PPE provided.

### ***Prevention of Falls***

Falls cause a large number of occupational injuries in the building and construction industry and sometimes result in permanent disabling injuries or death.

**Note:** Students on work experience must not work at heights where there is any risk of a fall. This information is designed to give students an understanding of the hazard and some of its risk control measures.

**Key Point**

Many falls in the work place involve employees aged less than 25 years.

A fall can cause injury to your arms, legs, back, neck or head. Neck and head injuries can cause serious damage to the spinal cord and nervous system.

Falls can be grouped into the following three categories:

1. falls from height (a fall from one level to another)
2. falls into a depth (falling into a hole), and
3. slips, trips and falls (falls on the same level).

Factors that may cause you to fall include situations where:

- movement suddenly starts or stops
- you are moving from one surface to another
- the surface is not capable of supporting a load
- openings or holes are not identified or protected
- open edges are not protected
- levels change
- hand grip is lost
- surfaces are slippery (e.g. surfaces are wet, polished or oily)
- footwear is unsuitable
- equipment, tools or rubbish are causing obstructions in work areas
- ladders are used incorrectly
- clothing is caught



- surfaces move
- lighting is unsatisfactory
- weather conditions are bad (e.g. heavy rain or wind)
- you are struck by a moving or falling object or
- fall arrest systems and devices are not provided, or are used incorrectly.

Other factors, such as exposure to chemicals or electricity, may have a harmful effect on your behaviour or performance and may increase the risk of a fall.

## 1. Falls from height

Accident reports show that you are more likely to fall from a height when you are working on:

- roofs and support beams
- climbing equipment that is incorrectly set up or erected (e.g. ladders, stairs)
- supporting equipment that is incorrectly set up or erected (e.g. scaffolds, ramps), and
- trucks and cherry pickers.

Your employer must have safe systems of work in place to reduce the risk of falls from height. This may include:

- safe use of building maintenance units
- correctly erected scaffolding (or other types of safe working platforms)
- a safe means of entering and leaving the area where you are required to work
- guard rails, covers, fender boards or other forms of safeguarding
- correctly erected and secured ladders and
- fall prevention equipment (such as a safety harness), which complies with Australian Standards.

### Roof work

Many falls from and through roofs occur during maintenance, renovation and cleaning work.

#### Key Point

Your employer must make sure roof edges are guarded to prevent falls due to over-balancing.

Some materials used on roofs can become fragile or brittle after exposure to weather. Serious injuries and fatalities have occurred when employees have fallen through roofs made of brittle materials, such as asbestos cement sheets, translucent plastic sheets and glass skylights.

#### Key Point

You must not stand on, or walk across, a roof made of fragile material.



Work on fragile material should be carried out from a scaffold or other working platform. This must be done even if mesh has been installed as a 'safety net'.

To make sure people are aware of the potential fall hazard, the following notice should be displayed:

**DANGER  
FRAGILE ROOFING  
USE WORKING PLATFORM**

The use of protective steel/wire mesh for roofs is recommended during construction in accordance with the **Victorian Safe Work on Roofs Code of Practice**. It protects employees against falls during roof construction and provides protection for future work activities on the roof. Before starting any work on roofs, the condition of the wire mesh and sheeting must be examined.

**Key Point**

Steel mesh, harnesses, nets and guardrails will restrain a fall.

### Scaffolding

Erectors and installers of scaffolding have legal responsibilities under the Plant Regulations 1995 to make sure the scaffolding is correctly erected, and will not present risk if safety instructions for its use are followed.

Mobile scaffolds are often hired and used by finishing trades people (such as painters and plasterers) who may have limited knowledge of scaffolds. Mobile scaffolds are easy to erect, use and dismantle, but are safe only if erected by a competent person. Instructions on the safe assembly of a mobile scaffold are available from the supplier. These instructions are also displayed on most mobile scaffolds as a sticker. Your employer should make sure these instructions are followed.

Adequate supervision should be provided on any site to make sure that stable scaffolding is erected with proper guardrails. Guardrails can prevent falls from a working platform.

Common problems occur with mobile scaffolding when:

- there has been a lack of training and instruction in erecting or using a scaffold
- workers ride on a mobile scaffold while it is being moved
- wheels are not locked when the scaffold is stationary or
- access ladders are not placed on the inside of the scaffold.

**Key Point**

Mobile scaffolds can be easily overturned because they are so light. Do not climb on the outside of a mobile scaffold, as this can cause it to overturn.



## Ladder safety

Ladders can be hazardous if they are not correctly maintained and used. Your employer should make sure they are properly stored and inspected regularly. Ladders should be used only for light work of short duration, or for access.

Your employer or supervisor should give you instructions and show you how to use a ladder safely, as well as the safety checks to make before using a ladder.

These include checking that the ladder:

- has no damaged, loose or missing parts
- is properly erected and secured
- projects at least 1 metre above the surface on which the climber will step off
- is set at the correct angle of 75 degrees, and
- is set on firm and level ground.

## 2. Falls into a depth

Construction and excavation sites often have trenches or holes, which are hazards if left unprotected. Falls into lift shafts, sewers, wells, tanks and stairwells are examples of falls into a depth.

Steel/wire mesh and covers protect people from falling down holes or shafts at work sites, and guardrails are used on open edges such as stairwells.

Your employer or supervisor should make sure that signs are placed to warn anyone on the site that there is a hole underneath, and that the cover must not be removed.

Covers should be securely fixed and marked in clear lettering:

**DO NOT REMOVE - HOLE UNDERNEATH**

## 3. Slips, trips and falls

Slippery and uneven floors or surfaces are a serious hazard in work places and can result in far more serious accidents than simply tripping or falling over.

You face an increased risk of slips and trips in the building and construction industry as the ground surface, floors or other building surfaces may be slippery, uneven, sloping or cluttered with objects.

Objects left where people are moving around can be hazardous. These include things like building materials, power tools and equipment, bags of cement or any building products. You could trip, stumble or bump into something, resulting in an injury, or objects could fall on you or others.

### Key Point

Safe work procedures for preventing slips, trips and falls will vary between work places and should be provided by the employer.



## ***Machinery and Equipment***

### **Mobile Plant**

Working with or near powered mobile plant (machinery and equipment) can be dangerous. Mobile plant used on building and construction sites includes trucks, cranes and earth moving machinery such as bulldozers, bobcats and graders.

Mobile plant used for construction is usually heavy, and often operates on muddy and uneven ground, or in situations where visibility for the driver may be limited.

You should keep well clear of any machinery or equipment while it is being operated, and you should continually check your work area to make sure it is safe for you to move around.

### **Nail Guns**

Air operated nail guns are widely used in the building and construction industry.

Used safely, nail guns can save time and money, but they can also be lethal weapons. Accidents with nail guns are regularly reported to WorkSafe. In many cases, investigations find that the equipment was misused - accidentally, deliberately or carelessly - and often it had not been properly maintained.

A person should not operate a nail gun at a work place unless one or more safety warning signs with the words "WARNING - NAIL GUN IN USE - KEEP CLEAR" are clearly displayed at or near the area where the nail gun is to be used.

#### **Key Point**

Never use a nailing tool unless you have been given instructions and training on its safe use, and a competent person supervises you.

### **Current Department of Education & Training policy:**

prohibits students undertaking tasks that include the use of machines such as:

- rip saw
- band saw
- buzzer
- thicknesser
- guillotine
- spindle moulder
- docking saw and
- power wood shapers.

This list is comprehensive but not exhaustive.



No student should be asked to perform work on any machine that may present significant risks in operation. Work experience activity in such cases must be limited to observing, under supervision, trained and experienced operators.

The health and safety information here is designed to give students an understanding of the hazards and of the measures by which risks are controlled in the manufacturing industry.

## *Electricity*

Note: Students on work experience must not undertake any task which may place them at risk from electrical sources. This information is designed to give students an understanding of the hazard and some of its risk control measures.

The most common cause of electrocution in the construction industry is contact with overhead wires. This is because people can misjudge heights and distances between the ground and overhead wires when carrying equipment like poles and ladders, or operating equipment with height extension, such as cranes. Electrical tools and machinery that may be outdated and poorly maintained are also hazardous.

Your employer must have safe work procedures for working near overhead wires, and a documented maintenance program in place.

Your employer should also provide residual current devices (RCDs) or safety switches to reduce the risk of electric shock and electrocution. RCDs are an additional safety measure, not a substitute for them.

You must follow safe work procedures for working with electrical equipment and report any breakdowns or faulty equipment to your supervisor.

## *Hazardous Substances and Dangerous Goods*

Hazardous substances and dangerous goods you may encounter in the building and construction industry include silica dust, asbestos, synthetic mineral fibres (such as fibreglass), cement dust, glue, paint or solvents.

Hazardous substances may cause sudden harm to your health such as dizziness, nausea and itchy eyes or skin. Exposure to dusts and solvents may cause skin diseases like dermatitis and respiratory disease. Some people are more prone to harmful effects from hazardous substances than others.

Dangerous goods may be corrosive, flammable, explosive, spontaneously combustible, toxic, oxidising, or water-reactive. They must be identified in the work place (and when being transported) by a coloured "diamond" symbol.

Hazardous substances are classified only on the basis of health effects, whether acute (immediate) or chronic (longer term). Dangerous goods are classified on the basis of immediate physical or chemical effects, such as fire, explosion, corrosion and poisoning. An incident involving dangerous goods has the potential to seriously affect property or the environment.



Your employer should make sure you use hazardous substances and dangerous goods according to the manufacturers or supplier's written instructions (found on both the label and in the Material Safety Data Sheet or MSDS). You must follow the agreed safe work procedures for using hazardous substances and dangerous goods in your work place. If you are not sure, ask your supervisor.

Your employer should provide correct personal protective equipment and clothing (PPE) when hazards related to using hazardous substances and dangerous goods cannot be eliminated, or to increase your level of protection. You must be trained in safely handling and storing them.

You must use items of PPE provided to you, in accordance with your training and with safe working procedures. You may need to use items such as a dust mask or air breathing respirator, gloves and safety glasses when working with hazardous substances and dangerous goods, or during building activity that generates dust.

### ***Manual Handling***

Approximately 27% of all manual handling LTI/Ds (lost time injuries and diseases reported where an employee is off work for one day or more) occur in the building and construction industry. Almost half these injuries involve the lower back, and they often result in employees being unable to continue working in the industry.

In the construction industry, many tasks involve manually handling building materials, products and equipment, or setting up working platforms. You may be required to lift or move things like timber, steel, bags of cement, ladders and power tools.

Your employer must train you, and make sure you follow safe manual handling methods. Get someone to help you lift heavy items and use a builders' hoist, trolley or wheel barrow to lift and move items safely. Never overload a wheel barrow or trolley. It is safer to make an extra trip.

#### **Key Point**

Even though you may be young and new to the job, you should speak up - talk to your supervisor - if you feel the job is too heavy, too difficult, too tiring, or puts you at any risk of injury.

### ***Noise***

Many tools and items of machinery you may use in the building and construction industry are very noisy, and have the potential to cause permanent hearing loss.

Employees, such as drivers of earth moving equipment and cranes, electricians, roof carpenters, finishing carpenters and roof tilers can be exposed to high noise levels. Many are frequently exposed for long periods of time to noise levels exceeding 85 dB(A), which is the level where noise control measures should be taken.

If you have to raise your voice to be heard by someone a metre away, your hearing could be at risk.





Your employer should provide solutions to noise hazards. Building and construction industry noise solutions include substituting quieter blades for brick saws, quieter nozzles for air blowers, and choosing quieter equipment such as brooms or vacuum cleaners instead of blowers. Keeping equipment in good condition also reduces the noise it generates when in operation.

It may be possible for your employer to arrange the site layout so noisy processes are located away from employees not involved in their operation. Portable barriers can also be used around static equipment like generators and concrete pumps.

If the noise cannot be reduced at its source, and there is no other way to separate people from damaging noise exposure, your employer should provide personal hearing protection such as ear muffs or plugs and you must wear them where provided.

### ***Sunburn and Heat Stress***

In the building and construction industry, you will often have to work outdoors on building sites and in partially constructed buildings where there is no protection from the sun, or where work conditions are extremely hot. For employees such as brick layers, concrete employees, roof carpenters and tilers working outdoors there is a risk of heat stress, sun stroke, sunburn and skin cancer from prolonged exposure to ultraviolet (UV) radiation from the sun.

The effects of exposure to the sun are cumulative - the longer the skin is exposed, the greater the risk of skin cancers, regardless of tan or skin pigment. Short-term risks include sunburn blistering and peeling, acute skin reactions with certain drugs, ointments and creams, and sore gritty, swollen eyes, sensitive to bright light. Long-term risks include skin cancers, premature ageing, wrinkling, wasting skin tissues, excessive pigmentation, and clusters of tiny blood vessels and cataracts of the eye.

Your employer should assess whether the day's tasks could cause heat stress or heat stroke, and consider ways of eliminating or reducing the risks by considering factors like the weather forecast, availability of shade, knowledge of the job ahead and an awareness of individual heat tolerance. Where possible, your employer should re-schedule heavier work for cooler times of the day (or wait for cooler days), and rotate work so you spend less time on heavier tasks.

Your employer should train you in safe work procedures for working in the sun and in hot areas of the work place. Training should spell out the action required if an employee shows symptoms of heat stress or sun stroke.

### **Heat stress**

The effects of heat stress range from simple discomfort to life-threatening illnesses such as heat stroke. Heat stress does make it difficult to concentrate on the job, which can also be hazardous. Signs of heat stress include tiredness, irritability, inattention and muscular cramps.

If you believe someone may be suffering the effects of heat stress, rest them in a cool, airy area and give them cool (rather than cold) fluids. Report the problem immediately to your supervisor or first aid officer.



## Heat stroke

Heat stroke is not common. A person suffering from heat stroke will stop sweating and body temperature will be high. Skin will be hot and dry. Confusion and loss of consciousness may occur.

Heat stroke is life threatening and urgent treatment by a doctor is very important. While waiting for medical help to arrive, cool the patient as quickly as possible. Soaking the person's clothes with cold water and increasing air movement by fanning can do this. If the person is conscious, give them water to drink.

## Ways to reduce the risk

Your employer should make sure you are trained in ways to reduce the risk of sunburn, heat stress and heat stroke. Some of these are:

- drinking lots of water, juices or soft drinks
- taking rest breaks in a cool place
- wearing cool, protective clothing such as a shirt with collar and long sleeves and long trousers
- wearing a broad brimmed hat that shades your head, neck, face and ears
- applying SPF30+ sunscreen before exposure to sunlight as well as on overcast days - noses, lips, ears, necks and backs of hands need extra protection. Sunscreen should be reapplied regularly
- wearing sunglasses that conform to Australian Standard 1067 - 1990
- if possible, working in shaded areas in the high-risk hours between 11am and 3pm
- not working near reflective surfaces such as water, cement, shiny metal or white painted sheds between 11am and 3pm.



## ***Job Safety Analysis***

Job Safety Analysis (JSA) is a method of identifying hazards and developing ways to manage them.

Basically, completing a JSA means taking the time before doing a job to plan for safety, rather than starting work assuming that everyone involved knows what to do and how to do it safely.

### **Key Point**

JSA is the responsibility of your supervisor, but you may be asked to contribute your ideas and knowledge about the job.

There are 3 ways of doing a JSA:

1. **Direct Observation:** - The supervisor watches and discusses job steps, hazards and solutions with the employee doing the job.
2. **Group Discussion:** - A team of people familiar with all aspects of the job identifies the steps, hazards and solutions. The supervisor leads the team.
3. **Recall and Check:** - The supervisor prepares a draft version of the analysis based on his or her knowledge of the job, and checks this by discussing it with the employee (and where necessary, by observing the job being carried out).

Jobs that could be considered for a JSA include:

- jobs with a history of many accidents
- newly established jobs, and
- jobs that could result in serious injuries or fatalities if risks are not controlled.

## ***Self-Assessment Questions***

Now try the self-assessment questions. Before starting the questions, be sure to enter your name and the name of the school exactly as you want it to appear on your Award of Attainment. We ask you to provide these details so that you can be issued with the Award of Attainment.

There are 16 questions. If you get 12 or more correct you can print online a safe@work Award of Attainment. The Principal of your school will then sign the Award of Attainment and validate it with the school stamp.